

Contractors *and* Engineers Monthly

Vol. 39, No. 5

MAY, 1942

\$2 a Year, 20 Cents a Copy

Highlights Of This Issue

• Wartime Construction

With "Speed and More Speed" the national slogan, wartime construction continues "ahead of schedule". This issue contains articles on the aggregate and concrete handling methods for a large Navy dry dock; grading and drainage operations at a southern airport; the soil-cement base stabilization and bituminous paving of a camp access road; and the paving of streets at a Naval air field.

See pages 1, 2, 9 and 40.

• Flood Control Projects

Needed flood-control projects to protect industrial areas from the devastating effects of high water include the Stonycreek River channel improvement in Pennsylvania and the construction of Whitney Point Dam in New York State.

See pages 1 and 18.

• County Road Work

Economy, good organization and careful maintenance of present equipment are absolutely necessary if county highway departments are to keep their present road systems in condition to carry necessary traffic. The organization, equipment and road program of a well-organized county department are described in this issue.

See page 2.

• Servicing Trucks

A helpful truck servicing schedule to keep your present truck fleets operating at maximum efficiency is outlined in this issue. Keep 'em rolling!

See page 33.



C. & E. M. Photo
Pile driving within the sheet-piling cofferdam for Pier 6 of the new Chippewa River Bridge on the strategic network at Eau Claire, Wis. See page 11.



C. & E. M. Photo
S. J. Groves & Sons' service truck with an 800-watt Kohler plant and two Westinghouse floodlights for lighting night work on the Stonycreek River Channel improvement.

Channel Improved To Control Floods

S. J. Groves & Sons Co. Cut New Channel and Paved the Slopes of Stonycreek River in Johnstown, Pa.

(Photo on page 52)

✦ ALTHOUGH May 31, 1889, is the date to which one's mind turns when floods and Johnstown, Pa., are mentioned in the same sentence, it is not that one great disaster that has caused the most damage to the city by high water. Situated at the junction of the Little Conemaugh River and Stonycreek River which unite to form the Big Conemaugh River in a very hilly country, flash floods are possible and too frequently have flooded important manufacturing sites, such as the big plant of the Bethlehem Steel Co., located in the vicinity.

To provide adequate channel area with a high value for C, the U. S. Engineer Department has completed a series of projects on the Big and Little Conemaugh Rivers and at the present time is completing an 8,600-foot contract for

(Concluded on page 36)

IN THIS ISSUE

Access Road Work.....	9
Airport Construction.....	2
Bituminous Paving.....	9, 40
Bridge Construction.....	8, 11
Care of Equipment.....	33, 39
Cartoons.....	4
Concrete Paving.....	14
County Road Work.....	2
Dam Construction.....	18
Dry Dock Construction.....	1
Editorial.....	4
Flood Control.....	1, 18
Grading.....	2, 6
Highway Maintenance.....	22
Legal Decisions.....	45
Road Mix.....	26, 27, 40
Roads in Wartime.....	4, 5
Roadside Development.....	7, 16, 32
Salvage.....	10
Stabilized Roads.....	9, 48
Wartime Construction.....	1, 2, 9, 40
Wartime Rulings.....	4, 5, 7, 10, 15

Materials Handling For Construction Of Large Dry Dock

✦ AMASSING a stockpile of 155,000 cubic yards of sand and gravel to insure materials for concreting during the winter, when local aggregate pits would be closed, was but one of the material-handling problems in the construction of the new graving dock being built for the U. S. Navy on the eastern coast.

Heating equipment for aggregates and water and a complete batching and mixing plant were installed, with five Pumpcrete units for delivering the concrete through five separate lines to a huge tremie barge of unique design. Concreting started early in December, 1941, and continued through the winter so as to permit unwatering the great structure at the earliest possible date for completion of construction in the dry. Careful planning by Navy engineers and by the contractors so as to insure the delivery of materials in an unbroken stream made possible a realization of

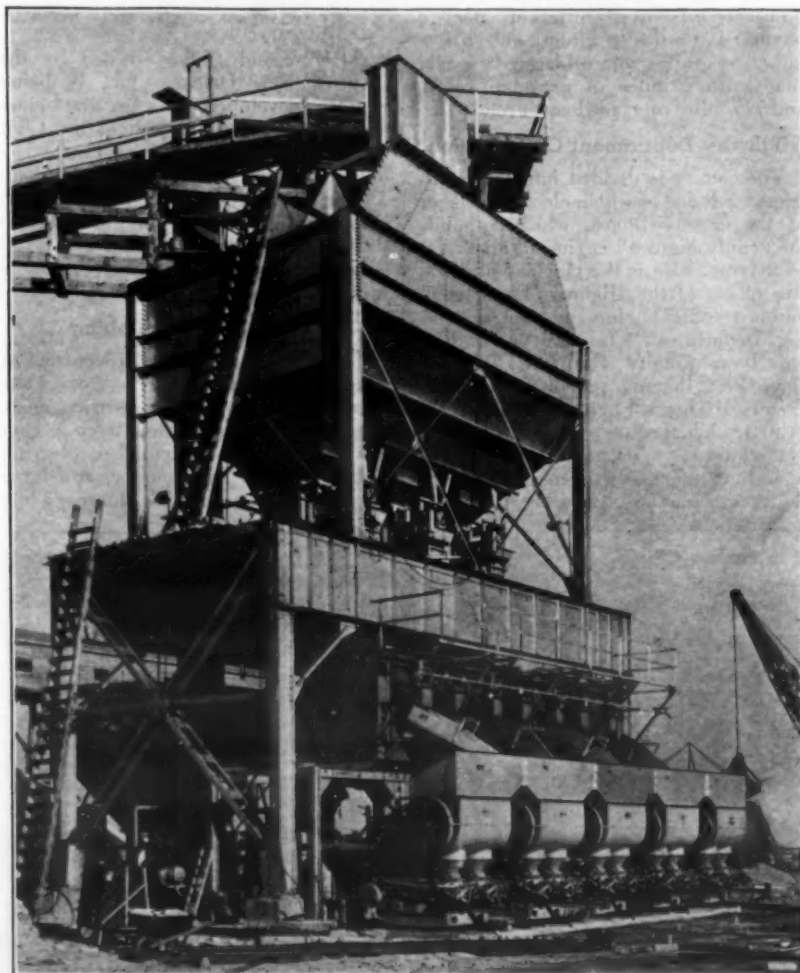
Conveyors for Aggregate Storage, Bins and Tunnel, And Concrete Plant at Eastern Naval Project

the slogan "speed, Speed, more SPEED".

Aggregate Unloading and Storage

Navy specification 1-inch and 2-inch gravel and sand were delivered by barge from nearby commercial sources and unloaded by a Koehring crane with an 85-foot boom and a 1½-yard Hayward clamshell bucket, assisted at times by a second crane. These unloading cranes delivered the material to two hoppers. One, the main feed hopper, is directly over the lower end of a 200-foot conveyor belt, 36 inches wide, which carries the material up to the

(Continued on page 12)



U. S. Navy Photo

The concrete plant before enclosing, showing batchers, mixers and concrete pumps.

Large County Budget Carefully Controlled

St. Louis County, Minnesota, Has Well-Planned Layout; Garages and Equipment Are Spotted Throughout County

✦ DURING an interview with George W. Deibler, County Engineer of St. Louis County in northern Minnesota, he stressed the importance of careful accounting so that every item of expense in the County Highway Department may be fully checked, every piece of equipment may be shown to be earning its way and every man producing his share of the work in caring for 2,865 miles of county roads and 710 miles of town roads in an area of 6,700 square miles. The annual reports of St. Louis County are the envy of most county engineers, for the summaries show the actual cost per hour of operation of each machine over a period of years and the cost of repair, gas, oil and labor.

All this is made possible by the Accounting Division of the County which, by means of the punch card system of International Business Machines, records the data for each piece of equipment, each employee and all purchases. Then, by means of the automatic sorting machine, it is possible to pick out any item or series of items desired for analysis with utmost accuracy, and in a minimum of time.

St. Louis County has a population of 200,000, about one half of which is in the city of Duluth. The rural section is devoted to agriculture, reforestation, and recreational activities, with large areas of sparsely-settled cut-over lands between the rural communities. The great Mesabi and Vermilion iron ranges lie across the center of the county from east to west, and include several wealthy townships which do all of their own highway work because of the availability of tax funds in those sections.

The county highway system of 2,865 miles consists of 31 miles of concrete paving, 190 miles of bituminous surfacing, 250 miles of oil-treated gravel roads, 1,677 miles of graveled roads, and 717 miles of graded earth roads.

Highway Department Organization

The county is divided into seven districts, each one of which elects a member of the County Board, which appoints the county highway engineer for a term of 2 years. He is the chief administrative officer of the Highway Department and is the chief engineer of the Engineering Department. George W. Deibler has been County Highway Engineer since 1938, having served as Assistant County Highway Engineer for 18 years prior to that time.

For purposes of administration and operation, the same seven districts are

used by the County Highway Department, and in each of them a garage, shop or warehouse is located for better operation through decentralization of equipment. The First District, in which there are only 40 miles of roads within the city limits of Duluth, is a small district with a small shop, manned by a single mechanic at Duluth Heights, close by the county seat at Duluth. The Second District, also near Duluth, contains 291 miles of county road and has a good-sized shop with a mechanic, an assistant mechanic, a helper and a stock man at Woodland. The Third District has 57 miles of roads, including city streets, with headquarters and one mechanic in a small shop and storage shed at Hermantown, not far from Duluth.

The Fourth District is centered at Ely, where there is a large shop with one shop foreman, a mechanic, an assistant mechanic and stock man to care for the equipment which maintains the 301 miles of road in this district. There are also patrol garages at Tower, Angora, Cook and Buyck. These patrol garages each store a truck and a grader and contain an office and space for signs and other stores, and each patrol unit is responsible for about 80 miles of road. There are no patrol garages in the First or Third Districts, but the Second District has one patrol garage.

The Fifth District contains 801 miles



C. & E. M. Photo

The St. Louis County Fifth District Garage and Shop at Pike Lake, Minn.

of road and has a storage garage with a shop foreman, one mechanic, two assistant mechanics, a mechanic's helper and a stock man at Pike Lake, about 15 miles from Duluth. This district has patrol garages at Adolph, Floodwood, Cotton, Brookston, Alborn, and a patrol garage for 10 units at Meadowlands. The Pike Lake storage garage and accessory buildings will be described in some detail later in this article.

The Sixth District has two main shops, one at Virginia and the other at Eveleth, each manned by a mechanic, an assistant mechanic and a stock man, with a shop foreman and a machinist at Virginia. There are 752 miles of road in this district and five patrol garages located at Pike, Embarrass, Makinen, Fairbanks and Zim.

The Seventh District also has two main garages located at Hibbing and Linden Grove. At Hibbing there is one mechanic, an assistant mechanic, a helper and a stock man, and at Linden Grove,

one assistant mechanic. There are 714 miles of road in this district and patrol garages at Sturgeon, Greaney, Kabetogama, Alango, Kinney, and Cherry.

Income for Road Work

All funds for the County Highway Department are appropriated by the County Board. The income which was expendable for highway work in 1940-41 included \$1,210,000 from the real and personal property tax, \$144,000 from the return of the state gas tax, and \$36,000 from state aid funds. The State Board of Allocation can give to a single county from 1 to 3 per cent of the state gas tax monies allocated to counties. St. Louis County receives 3 per cent. The 1-mill tax levied by the state for aid to counties is allocated in the same manner. This state-aid money must be spent by the counties in a definite prescribed manner. Forty per cent must be spent for the maintenance of state roads and 60 per cent for construction. These funds are paid to the counties by the State Commissioner of Highways on vouchers. There is no restriction on the manner of expenditure of the gas tax money as between construction, maintenance, new equipment, etc.

Budget and Rental System

The funds received by the County Highway Department are carefully budgeted by districts under: maintenance; construction; construction, Federal-Aid secondary roads; equipment and stores; and administration. The budget in each district is further broken down under the same headings into patrol districts.

All equipment is operated on the rental system, and each project must pay all the equipment used on it through the Equipment Revolving Fund. St. Louis County has been using the rental system for twelve years and the present rental rates for six years, starting out with rentals based on the state equipment rental rates, and those received from various localities. Adjustments were made in these according to conditions in St. Louis County, and it is now felt that certain types of equipment should have further adjustments in the rentals. By means of this rental system

(Continued on page 24)

Grading for Paving At Southern Airport

Norman Const. Co. Clears Virgin Timber Preparing For W. R. Aldrich Grading And Drainage Contract

(Photo on page 52)

✦ THE second airport owned by the City of New Orleans, La., is being rapidly developed into a first class port of 372 acres, as part of the Civil Aeronautics Authority program. The old sod runways have been regraded, a new drainage system installed, the second-growth timber on the old cultivated section removed, and some 150 acres of virgin timber, averaging 2 feet diameter at the base, cleared out.

Clearing and Grubbing

The clearing and grubbing contractor, Norman Construction Co., of Lake Charles, La., handled the clearing in an expeditious manner. In striking contrast with the usual method of clearing in this part of the country, for levee bases, the stumps were loosened by

Hercules 40 per cent dynamite and then pulled out by a D7 tractor and steel cable, using a loose line and jerking the stumps clear of the ground. The contractor used two D7's for this work, and one Caterpillar diesel Twenty-Two with a bulldozer and 22-inch treads for work in soft ground so that operations might be continued shortly after rains had ceased, which put out of commission most equipment working on the buckshot gumbo soil. The timber removed was cypress, oak, tupelo gum and ash, with maximum trunk diameters of 4 feet and an average of about 2 feet. The specifications required that all roots 3 inches and larger be grubbed down 3 feet from the surface to permit good grading operations. All this was necessarily done with hand labor. A Caterpillar D7 and LaPlant-Choate bulldozer were used for filling the root holes, compacting the material with tractor treads.

An interesting comparison with the clearing of levee base right-of-way is afforded by the Superintendent on clearing and grubbing, who has handled both types of work. On levee operations, the trees are merely pushed over, so that the stumps come out of the ground with large balls of dirt and are pushed outside the 500-foot right-of-way of the levee. At the airport, all of these stumps had to be reduced to ashes; hence the blasting operation, which freed the stumps of dirt. In the summer of 1940, the Superintendent completed 100 acres of levee-base clearing in 3 months, using only 100 pounds of dynamite, no hand-sawing, but one D7 tractor with a LaPlant-Choate bulldozer, and for labor one tractor operator and two laborers. On the airport clearing, 100 acres were cleared between September 22, 1941, and October 24, 1941, using 8 tons of dynamite, three tractors, 90 hand laborers and four foremen, working a 10-

(Continued on page 28)



C. & E. M. Photo

A brick manhole with two 24-inch, one 48-inch and one 54-inch concrete drainage pipe entering it.



C. & E. M. Photo

Overhauling a truck engine in the Fifth District Garage, St. Louis County, Minnesota.

Plan tomorrow's Highway program today

27-mile resurfacing project of
Mahoning County, O.,
offers helpful suggestion



Old macadam roads like this one are hard on tires and on cars.



But they provide an excellent base for a new Texaco Asphalt surface.



Kelley & Meyer resurfaced 27 miles of macadam roads in Mahoning County, Ohio, with TEXACO.

To wage a successful "all out" war, even such a normally important activity as highway building must be curtailed. That's true.

But, while actual work on our highways is under temporary curtailment, there should be no let-up in laying plans for future road programs.

To the highway official who is planning tomorrow's road program today, a project completed last year in Mahoning County, Ohio, offers a helpful suggestion—

Mahoning County had 27 miles of macadam roads—old, narrow and rough—on which maintenance had become excessive. Unsatisfactory as a surface, the old macadam provided an excellent base. So the county resurfaced the entire mileage with a plant-mixed TEXACO Asphalt top. Moderate in cost, this resilient TEXACO pavement will serve fairly heavy traffic for years with very little upkeep.

Plan now to salvage your own old macadam roads as Mahoning County did—with TEXACO Asphalt.



THE TEXAS COMPANY, Asphalt Sales Dept., 135 East 42nd St., New York City

Boston

Philadelphia

Richmond

Chicago

Jacksonville

Houston

TEXACO ASPHALT

Contractors and Engineers Monthly

THE NATIONAL BUSINESS PAPER FOR CIVIL ENGINEERING
CONTRACTORS AND HIGHWAY ENGINEERS AND COMMISSIONERS

Member of Controlled Circulation Audit

Issued Monthly by Bittenheim-Dix Publishing Corp.
Editorial and Business Office: 470 Fourth Ave., New York City
Printed in Mount Morris, Ill., U. S. A.

THEODORE REED KENDALL, Editor
EDGAR J. BUTTENHEIM, President
GEORGE S. CONOVER, Vice President
CAPT. MYRON MACLEOD, Advertising Manager
O. E. POTTER, Managing Editor
DONALD V. BUTTENHEIM, General Manager
HERBERT K. SAGE, Treasurer

BRANCH OFFICES

Chicago, Ill., Daily News Bldg., George S. Conover, Vice President; John T. Dix
San Francisco, Calif., Mills Bldg., and Los Angeles, Calif., Western Pacific Bldg., Duncan A. Scott & Co.

Copyright 1942 by Bittenheim-Dix Publishing Corp.

How Far Away Are Access Roads?

An access road, according to Public Roads Administration definition, serves a military area or munitions manufacturing plant. But how far does the traffic congestion created by these establishments extend? In most cases it reaches to the nearest communities, rural and urban, in every direction from which buses, private passenger vehicles or truck-hauled materials may travel. Then by simple extension we should include the workers commuting 50 miles or so over the road, and the raw materials and foodstuffs traveling 100 miles or more over the highway to provide work and food for the workers. Thus, we find the access road is everywhere.

Let us discard the extra 50 miles and confine our discussion to the 100-mile-diameter circle about the manufacturing plant. Even that will provide an excessive burden on highway funds for reconstruction, intensive maintenance and traffic handling. Judicious control of traffic can greatly relieve congestion and hence increase the hour-to-hour capacity of a highway. Staggering shifts at a plant can accomplish the same result.

Maxwell Halsey, speaking before the 1942 Michigan Highway Conference, pointed out that improving the traffic capacity of access roads is a question of administration to create more economical and faster movement of all war-effort highway traffic. Construction must be confined to the immediate access road, intensive maintenance to the remainder of the highway system, and a larger part of the highway dollar than heretofore must be expended in traffic engineering to increase the effective carrying capacity of highways and streets.

In applying more attention to administrative effort and perhaps somewhat less to technical matters, the state and county highway departments must change their usual viewpoint, clear the desks of interesting studies of purely statistical interest, and devote their entire energies to those things which will prove of inestimable value to the war effort. If there is a reduction in traffic within the next few months and you have done nothing, you have lost an opportunity to help conserve time, rubber, gasoline and vehicles, and above all to speed traffic when it is most needed. If traffic actually continues to increase, even if only in access road areas, you can never catch up with the problem.

In your administrative activities, your approach must be realistic—theory is out—get away from safety alone. Your efforts must produce safety on the highways plus a more economical and faster movement of traffic.

Maintenance will absorb a greater proportion of the highway dollar because construction, except on access roads, is out, so you must over-maintain. Your job is immediate action to create greater highway service with what you have by redesigning intersections for less traffic interference and faster

flow; increased use of channelization with much more mechanical control but eliminating stops by the judicious use of traffic lights; increase in regulatory control by education, more signs and mopping up by police action; redistributing traffic over less-traveled highways and streets to relieve congestion; staggering shifts at various plants and even within one plant to relieve congestion; more stringent parking regulations on streets and highways used by war-effort traffic; and adequate parking areas at industrial concentrations.

To accomplish these things Maxwell Halsey recommends that you secure these tools at once: 1. a map of the locations of all war-production plants in your area; 2. a list of employees; 3. the addresses of all workers; 4. what routes workers use to and from work; 5. the number of trucks serving each plant; 6. the routes used by trucks, (these give a traffic flow map for your use in determining the priorities of various types of traffic); 7. a study of the present speeds of traffic in order to see how to increase them, for "the forgotten man of traffic is speed"; 8. the accident rates on various routes and their locations, in order to make an effort to cure the sore spots, as accidents retard traffic flow; 9. see if you can cure accident delays by rerouting traffic (this may be done by resurfacing a route to take the load off another highway).

The temptation is to over-simplify the cure and improve everything. This, however, omits the administrative approach which selects the things which will have the greatest benefit and can be

Bituminous Products For Roads Restricted

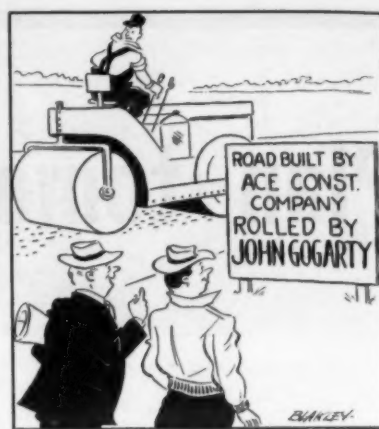
The diversion for war and other essential purposes of a part of the American tanker fleet normally employed in transporting petroleum and petroleum products to the Atlantic seaboard area, and the loss through war action of other tankers, has resulted in a shortage of transportation facilities for that area.

Because of this situation, Recommendation No. 45 has just been released by the Petroleum Coordinator for National Defense, directed to all state highway departments, and to all Federal, state, county and municipal agencies having jurisdiction over the construction, reconstruction, maintenance or repair of roads and highways in the Atlantic seaboard area, and to all suppliers of asphaltic and tar products in that area. This recommendation states that the use of asphaltic or tar products, including road oils, on highways or streets in the Atlantic seaboard area (which includes Connecticut, Delaware, Florida east of the Apalachicola River, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia, and the District of Columbia) for construction, reconstruction, paving, surfacing or resurfacing, or for maintenance or repair, must be deferred for the duration of the emergency, except in the case of highways or streets certified by the Public Roads Administration as necessary to the successful prosecution of the war, or for such work as the PRA deems essential.

The recommendation points out that unless such steps are taken at once, there will be serious petroleum shortages for war uses in that area.

done in the shortest time. Above we have given the positive attack on the problem. The negative side is equally important. See what activities you can abandon to enable you to concentrate on the positive attack. There is a great reluctance to shift to the real needs, the war needs, and a desire to hold to statistical frills.

Ask yourself these questions and answer with a disarming frankness: 1. What are you really doing to help win the war? 2. What can you get rid of in your administrative activities? 3. What have you got to get rid of to be able to act right now? When you have answered these questions frankly and honestly, go to it! Keep 'em rolling!



"He takes more pride in his work since we gave him a credit line."

Pot Holes in Roads Can Damage Tires On Motor Vehicles

On April 4, 1942, Don Goddard, whose 7:30 a.m. War Time broadcast over WEAJ is a "must" with many early risers and whose "News at Noon" is a helpful mid-day feature, spoke forth his mind as a layman on road maintenance. The following two paragraphs tell a story too pointed to need further editorial comment.

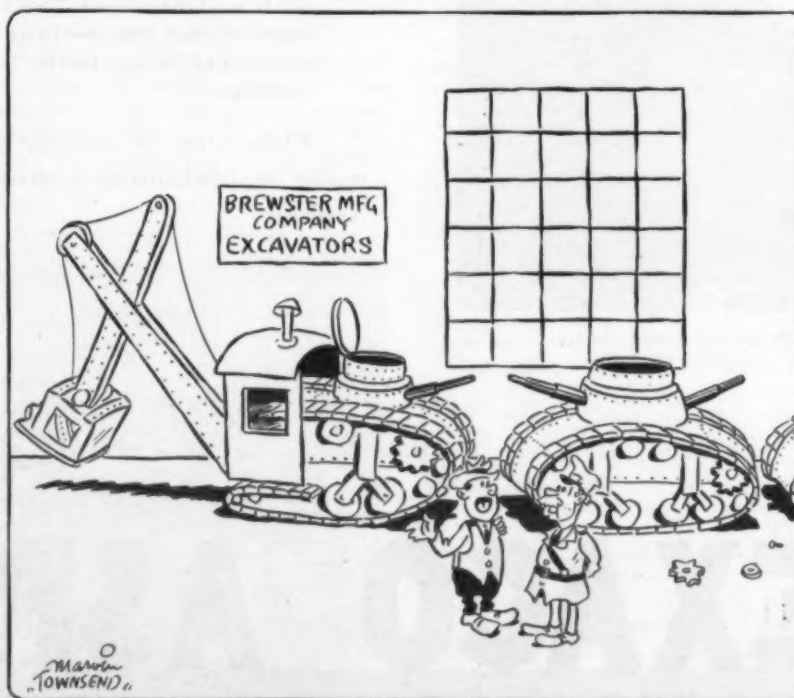
"I wish to come humbly forward this morning with a word from motorists to city and county officials. The government has asked us to be careful drivers to save our cars, gasoline, materials—to cut down our speeds. Many of us have decided to go on shanks' mare for the duration. But many of us, who have off time jobs, many doctors and so on and so on—will have to drive for the duration... we will cooperate of course to the extent of our ability, but we will have to use that automobile... and not for pleasure.

"Well, if we are going to save wear and tear on our cars, we'll have to have a little cooperation from you fellows... especially you who fix our roads and streets. I have recently had occasion to drive over a route some 35 miles long through typical American communities... ending my drive in the great city of New York. During that drive I bumped over seventeen sharp-edged unexpected holes improperly filled after repair crews had done their work. The shock was awful every time at speeds of not more than 35 to 40 miles an hour... How about it?"

Construction Men Needed

The United States Civil Service Commission, Washington, D. C., is now accepting applications for superintendents of construction for positions ranging in salary from \$3,200 to \$6,500. Men are wanted who are thoroughly familiar with the building industry, who know engineering materials and the standards of good workmanship, and who understand the business management of large construction projects, such as the costs, estimates, etc. Experience in the field of general construction, part of it as general superintendent on large construction projects involving excavation, reinforced concrete, steel, wood, and masonry, is required, varying in degree of responsibility and in length according to the grade of the position for which application is made. No closing date has been set for the receipt of applications.

There may be qualified persons available now who were formerly employed in work affected by the Government's war program. Persons who are qualified and available are urged to apply at once. Announcement 217, giving further information, may be obtained with the proper application forms at any first or second-class post office or from the U. S. Civil Service Commission, Washington, D. C.



"This is where we switched to war production."

Specification for Quick Repair of Bombed Surfaces

A timely pamphlet in the Asphalt Construction Series issued by The Asphalt Institute is its Specification for Stockpile Paving Mixtures for Making Quick Repairs of Bombed Surfaces. Under two main divisions of "Materials" and "Preparation and Composition of Mixture," this pamphlet contains eleven sections covering a general description, mineral aggregate, asphaltic materials, approval of materials, methods of testing, paving plant, preparation and composition of mixtures, stockpiling, and measurement and payment.

Single copies of this Specification, designated as CP-1, are available without charge from The Asphalt Institute, 801 Second Ave., New York City, by mentioning this item.

All Highway Construction Must Be Approved by WPB

Conservation Order L-41, effective April 9, 1942, prohibits the start of all unauthorized construction projects which use material and construction equipment needed in the war effort, and places all new publicly or privately financed construction under rigid control. This order goes much further than

the SPAB policy announcement of October 9, 1941, in that that announcement stated that no priority assistance would be given to non-essential construction. The more recent order states that no construction may be started without permission.

Road construction costing more than \$5,000 may not be initiated without permission of the War Production Board. However, it should be emphasized that this order does not affect ordinary maintenance and repair work necessary to return a structure to sound working condition without a change of design.

Although the present order applies only to construction not yet begun, proj-

ects already under construction are being carefully examined by the WPB on an individual basis, and such projects may be stopped if scarce materials to be used in them can be put to more effective use in the war program.

Watches for Engineers

The Veri-Thin Lexington 15-jewel watch with luminous dials and hands and a water-tight Guildite case was designed especially for engineers by the Gruen Watch Co., Time Hill, Cincinnati, Ohio. This and other featured watches are described in Folder M which the manufacturer will send free on request.



**IT'S JUST HORSE SENSE
ALL-WHEEL DRIVE and STEER
IS THE RIGHT ANSWER!**

● The All-Wheel Drive and Steer features of the "99M" and "88M" give these A-W Power Graders marked *load handling* and *blade control* superiorities. Both graders use the full traction of front and rear wheels. There is no idling front end to slow the grader, or cause the blade to fall away when the going gets tough. Instead the full horsepower is applied productively in moving full loads with "hairline" control of direction regardless of "side draft." Furthermore, with front and rear wheels set to steer just where the operator wants them, he can always utilize the most effective traction.

The inevitable superiority of these A-W "99M" and "88M" features makes itself felt in greater quantity, quality and variety of work... whether plowing, cutting down a bank, moving windrows up a slope, or doing heavy maintenance or oil mix. So, it's just plain horse sense to make your next grader an A-W "99M" or "88M". Only these machines have the All-Wheel Drive and Steer features that assure you controlled power for maximum speed of output under all conditions. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois.

THE
Austin-Western
POWER GRADERS

MOTOR GRADERS • BLADE GRADERS • ELEVATING GRADERS
SCRAPERS • CRUSHING AND SCREENING PLANTS • ROLLERS
ROLL-A-PLANS • MOTOR SWEEPERS • TRUCKS AND CRANES
SCARIFIERS • DUMP CARS • TRAIL CARS



Heavy Rock Grading In Nickel Country

A. E. Jupp Const. Co. Had 3-Mile Job
On Sudbury-Capreol Road in Center
Of Ontario Nickel Ore Deposits

★ THE heart of the nickel mining industry of North America is at Sudbury, Ontario, where the International Nickel Co. has its largest mining property. In order to permit operations to continue unchecked during this period when nickel is so much needed in munition manufacture, the Ontario Department of Highways released a portion of its right-of-way on the Sudbury-Capreol Road, which wound through the mining property, and relocated the highway to the east with a much straighter alignment. This involved a 3-mile grading contract, which was awarded to A. E. Jupp Construction Co., Ltd., of Toronto, Ontario, for \$150,000.

The removal of 60,000 cubic yards of hard granite rock and 20,000 cubic yards of earth and the placing of 1,400 cubic yards of concrete in culverts were required in the contract. Unusual glacial markings were apparent on the granite, which was stripped and drilled preparatory to blasting.

Drilling and Blasting

The contractor had a very interesting drilling outfit consisting of three 220-cubic foot Canadian Ingersoll-Rand compressors for operating five Canadian I-R jackhammers. Two of the compressors delivered air to one receiver, while the third delivered it to the other side of the major rock cut to a second receiver connected with the water-supply line which furnished water to the drill steel to cool the drills and clean the holes, similar to the methods used in mining operations.

A new type of detachable bit was used on this job. These bits, made by the Falcon Bridge Nickel Co., of Falcon Bridge, Ontario, have no threads for attaching the bit to the drill steel, but instead are made slightly elliptical so that, with steel shaped the same, there is a cam action which holds the bit tight on the steel during drilling, the rotation driving them tighter as the work progresses. All that is necessary to remove them is to give them a sharp blow in the



C. & E. M. Photo
A battery of three Canadian I-R compressors on a heavy rock cut north of Sudbury, Ontario. When the overburden was removed in this cut, a remarkably interesting display of glacial grooves was exposed.

reverse direction and it is reported that they drop off readily.

The hard granite was shot with 50 per cent dynamite and loaded by a Koehring 1½-yard shovel to rock trucks.

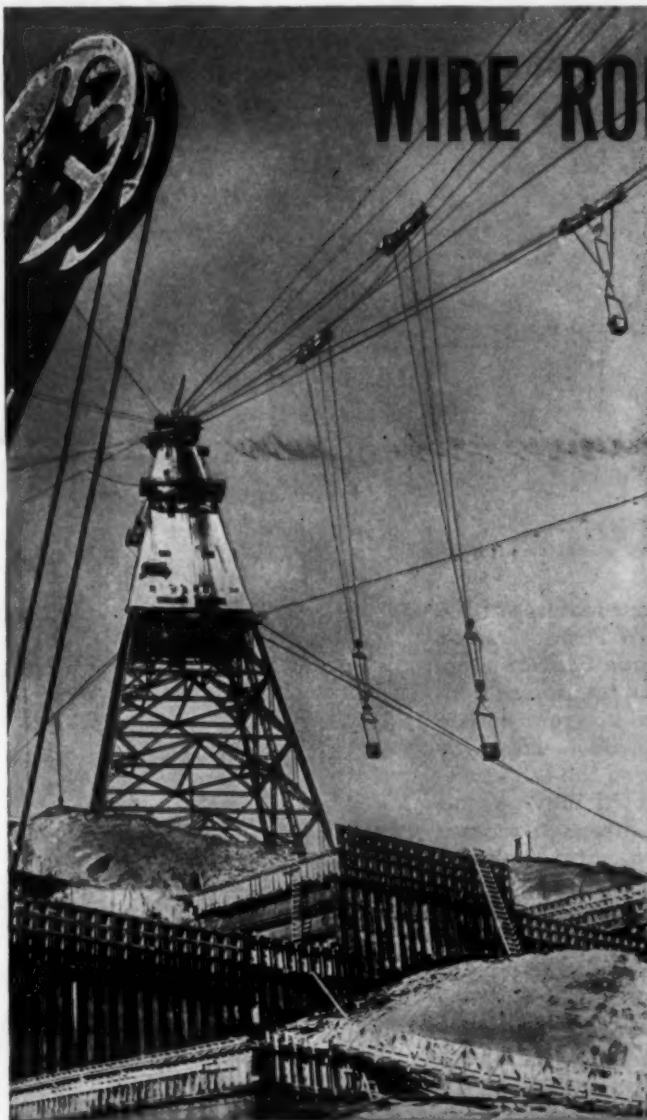
This work was carried on under the direction of C. F. Szamers, Division Engineer, Division 17, Sudbury District, Ontario Department of Highways.

Buy U. S. War Bonds and Stamps.

Diesel Engines for Power For Construction Jobs

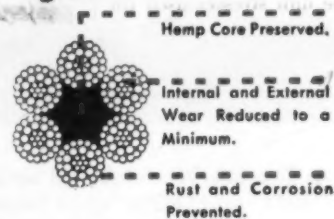
With over forty years of successful experience in the exclusive manufacture of internal-combustion engines, ten years ago the Atlas Imperial Diesel Engine Co., 100 Nineteenth Avenue, Oakland, Calif., began the manufacture of its series ES668 models which are used widely to power construction equipment. They are of the heavy-duty multi-cylinder vertical single-acting four-cycle trunk-piston type, fully enclosed, with en-bloc construction. They are built with 4, 5, 6 and 8 cylinders in line, with L-head design providing easy accessibility.

Bulletin No. 112, recently issued by this manufacturer, lists these engines with their conservative ratings and speed to insure continued efficiency, reliability, low maintenance cost and long life. Copies of this new illustrated bulletin replete with dimension programs, ratings and specifications may be secured by our readers direct from the manufacturer by mentioning this review.



WIRE ROPE PROTECTION

*for All-out
Production*



DON'T gamble with All-Out Production. Give your wire ropes maximum protection. Wear, rust and corrosion must be held to a minimum . . . and will be when you use Texaco Crater.

Texaco Crater penetrates to the very core of wire rope, coating each wire in a tough, viscous film that cuts down wear, seals out moisture, prolongs rope life.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred on prominent construction jobs throughout the country.

These Texaco users enjoy many benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate . . . just phone the nearest of more than 2300 Texaco distribution points in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N. Y.

FOR YOUR ENJOYMENT

FRED ALLEN every Sunday night.
See your local newspaper for
time and station.

Care for your Car
...for your Country



1881-1942

CONTRACTORS' EQUIPMENT

WHEELBARROWS

HOISTS

SCRAPERS

MORTAR BOXES

CONCRETE CARTS, BARROWS

CONCRETE MIXERS

(BATCH AND CONTINUOUS)

MORTAR MIXERS

BRICK and TILE BARROWS

HODS

etc., etc.

Write for complete
information, prices

LANSING COMPANY Products

"Keep Your Products on Wheels"
LANSING, MICHIGAN

Chicago New York Kansas City Boston Minneapolis Philadelphia San Francisco

THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horse-

power in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

Roadside Development Awards in Wartime

With all non-essential activity eliminated for the duration, roadside development this year must be more practical and less aesthetic. Soil-erosion projects to decrease maintenance expenditures and keep our present highways in the best possible condition; flattened seeded or sodded shoulders where civilian traffic may park to avoid interference with military traffic—these are the types of roadside development justified in wartime.

We shall make our Roadside Development Awards, for the 2-year period 1941-42, to highway contractors for their efforts to develop new and better equipment and methods, and for outstanding quality of work and cooperation beyond the requirements of specifications.

State highway department engineers should start now to prepare notes and sketches and secure photographs on roadside-development phases of current road work, in order to have complete data on the contractors' contribution to better and more effective roadsides for nominations to be filed by November 1, 1942.

For further information and details on these Awards, write to CONTRACTORS AND ENGINEERS MONTHLY, 470 Fourth Ave., New York City.

Further Restriction Placed on Steel Use

Instructions issued by the Federal Works Agency further restricts the use of steel bars in reinforced concrete and the use of structural steel. Steel reinforcing now may be used only if absolutely necessary where the use of more concrete will not serve the purpose.

These instructions read, "Structures should be designed, if possible, so as to eliminate the use of structural steel. However, in the event reinforcing steel is absolutely necessary, the quantity should be kept at a minimum for all types of structures. In order that this may be accomplished, the unit stresses used for reinforcing steel should be as high as is consistent with sound engineering practice and the amount of reinforcing steel kept at a minimum, even though additional concrete is used.

"Structural steel may be used only when 'absolutely essential'. Whenever structural steel is used, full justification must be furnished as to why wood, reinforced concrete or other substitutes can not be used. Also the weights of structural steels such as lintels, bearing plates, tension members in wood trusses, and other specific uses must be given separately. Cubic yards of concrete for both plain and reinforced concrete must be shown separately to permit a comparison of the quantity of reinforcing steel with the quantity of reinforced concrete."

This places a distinct responsibility on all designers of structures such as sewers, water conduits, walls and concrete paving. Colonel William N. Carey, Chief Engineer, Federal Works Agency, stipulates that the design of sewers and non-pressure water conduits shall be based on non-reinforced sections using tile, brick or concrete. The design of walls must be based on gravity sections where possible. If reinforced walls are necessary, however, the thickness at critical points should be made appreciably more than would be required for fully reinforced sections.

Don't Leave Blasting Caps For Children to Pick Up

All users of explosives are being asked to cooperate in the movement to protect children from the dangers of playing with blasting caps. Although warnings against allowing these caps to fall into the hands of children are contained in each box of caps, records show that many of them are left lying about. Those who use explosives can make themselves the most important factor in the movement to save children from unnecessary injury and sometimes death by making sure that the caps are carefully

stored where children can not get them.

Accidents to children from playing with blasting caps decreased in 1941 as compared with 1940. It is hoped that this year these dangers will be eliminated as completely as possible, and this can be done if there is wholehearted cooperation on the part of all.

Brown New A-C Vice Pres.

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., announced recently that Edwin H. Brown has been elected Vice President in charge of Engineering and Development. Prior to his promotion, Mr. Brown was Manager and Chief Engineer of the Engine and Condenser Department, the administration of which has now been taken over by M. L. Carson, Sales Engineer.

New Bulldozer Unit Announced by Adams

A new bulldozer, known as the No. 181, has been added to its line of road-building equipment by the J. D. Adams Co., Indianapolis, Ind. This bulldozer has been designed specifically for use on TD-18 wide-tread TracTracTors. It is single-cable controlled and engineered to provide even weight distribution necessary for good balance and maneuverability. The moldboard is designed to keep earth rolling smoothly at all speeds and is wide and high. A pusher attachment for use with scrapers is also available.

A convenient side-mounted control permits the operator to sit in a natural position facing the blade. Operation is by means of an Adams No. 20 single or



The new Adams 181 bulldozer for wide-tread TracTracTors.

double-drum power control unit or by a standard hoist attached to the power take-off of the tractor.

Complete information and specifications on this new Adams bulldozer are contained in Form 4121, copies of which may be secured direct from the manufacturer by mentioning this item, or from this magazine.

Clamshells

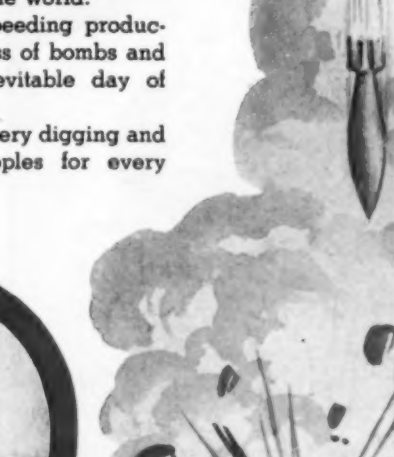
versus

Bombshells







**OWEN
BUCKET
& GRAPPLE**

SINCE DEFENSE and OFFENSE begin with construction, Owen Buckets and Grapples are predominantly in the forefront of activity in plants and fortresses throughout the world.

Their efficiency will aid in speeding production—in lessening the effectiveness of bombs and shells—and in speeding the inevitable day of victory.

There are Owen Buckets for every digging and handling use—and Owen Grapples for every stone handling requirement.

THE OWEN BUCKET CO.
8030 BREAKWATER AVE., CLEVELAND, O.
Branches: New York • Philadelphia • Chicago • Berkeley, Calif.



Dream Bridge, a creosoted-timber structure at Indian Lake, Logan County, Ohio.

Timber Bridges Save Critical Materials

With the increasing restrictions on construction materials made necessary by the faster tempo of war work, and the arming of our military forces, more consideration must be given to the use of those materials which are available in sufficient quantities to permit the continuance of construction without tapping the flow to our essential industries. One important field of construction in which this restriction is being felt is bridges. Fortunately a great number of smaller structures can be built of wood, either as pile-trestle structures or with arched trusses.

The Ohio Department of Highways has had a great deal of experience in designing this type of structure in the past for use on secondary roads and has given particular attention to details. At all times an endeavor has been made to combine a design that will not only meet necessary engineering requirements but also will produce a structure which is interesting from the architectural standpoint. Standard drawings have been adopted which are designed to meet various kinds of traffic requirement. There is a light timber bridge for an H-10 loading for use on secondary roads, while the standard bridge for H-15 loading is for heavily traveled or main highways. All materials used in creosoted structures must be of a standard grade, pressure-creosoted in accordance with the Ohio standard specifications which require that all ma-

terials be prefabricated before treating. This means that boring, shaping, notching, cutting to lengths, etc., is done before the treatment, which serves a two-fold purpose. Prefabrication be-

fore treatment means that no untreated lumber is exposed to the elements which would destroy the effectiveness of creosoted lumber and the prefabrication also saves a considerable amount of work in the field.

An example of a structure which is well designed from the engineering standpoint and attractive architecturally is shown in the accompanying photograph of Dream Bridge at Indian Lake in Logan County, Ohio. This bridge was designed in 1931 for an H-15 loading to take care of the widely diversified traffic at this particular location. A very heavy 18-inch piling was used, 32 feet long, with a deck built of 3 x 6 laminated flooring, all treated with creosote oil. At this particular location, an entrance to a summer resort, it was considered advisable to increase the attractiveness of the structure by the use of a rustic railing made from cedar wood and given a very light creosote treatment to enhance the rustic appearance and at the same time prevent decay.

We are indebted to The Jennison-Wright Corp., Toledo, Ohio, for the photograph which is used to illustrate this text.

National Carbide FLOOD LIGHTS



VALUABLE IN PEACETIME
A NECESSITY NOW

Simple in construction
Economical in cost
Dependable in operation
Available in 1500, 8,000 and 16,000-candlepower units

Write for literature showing complete lines of Floodlights and Lanterns.

NC-200
NATIONAL CARBIDE CORPORATION
68 E. 42nd St. New York, N. Y.

78 WAYS

TO SPEED WORK—
SAVE MONEY
with a LORAIN MOTO-CRANE

• Keep up-to-date on the newest and fastest equipment. This big, new, 32-page catalog is packed with time and money-saving ideas. It describes and illustrates 78 different jobs in 11 different industrial classifications. Facts and figures on every job are taken from actual field performance of many hundreds of Moto-Cranes already in service. Write for your copy today. It's free, of course.

UNIVERSAL CRANE DIVISION
THE THEW SHOVEL COMPANY
LORAIN, OHIO

ON
NATIONAL
DEFENSE

LOWEST COST FOR
HIGHEST DEPENDABILITY



Embury
Luck-E-Life
HIGHWAY TORCHES

Their dependability is proved—by tests and by performance. Designed and built to give you pre-determined safety under severest weather conditions. Easy to carry. Easy to service. Burns up to 48 hours on one filling. It's the highway torch you've been looking for.

Embury Mfg. Co., Warsaw, N.Y.



IT'S NOT A
MOTO-CRANE
UNLESS IT'S BUILT BY
THEW-LORAIN

Access Road to Camp Rushed to Completion

**Cement-Stabilized Base
And Hot-Mix Black Top
Laid on California Road
By Oswald Brothers**

By R. P. DAY

† THE Los Angeles contracting firm of Oswald Brothers recently completed a new access road designed to speed military and civil traffic into Camp Haan and March Field in California. The new road is designed with an eye for future improvement, and embodies a type of cement-stabilized subgrade both new and interesting to engineers and contractors in that part of the country.

Bituminous topping, laid on a selected subgrade stabilized with 8 per cent by weight of cement, and sloped in one direction to provide for a dividing strip and future lanes are the high points of design in the new 7,900-foot section. As is often the case, the design was fully carried out in the field under the \$40,000 Federal-Aid contract only after several natural obstacles were met and overcome by both the contractor and the resident engineer.

The history of the job is the same localized version of the reason why many other new roads are being built. March Field, established some time during the first World War, was served by a narrow oiled road which adequately handled its travel along with traffic bound for San Diego.

When March Field expanded two years ago, engineers of the California Division of Highways planned a new two-lane bituminous road to handle the additional traffic imposed both by military expansion and by the constantly heavier interstate and tourist travel. But even before this design was finished, a new training center, Camp Haan, sprang up across the way from March Field, and so it became apparent at once that a multiple-lane high-speed road should be built into the camps. The old highway crossed a railroad track, and the elimination of this crossing was taken care of in the new design.

Drainage

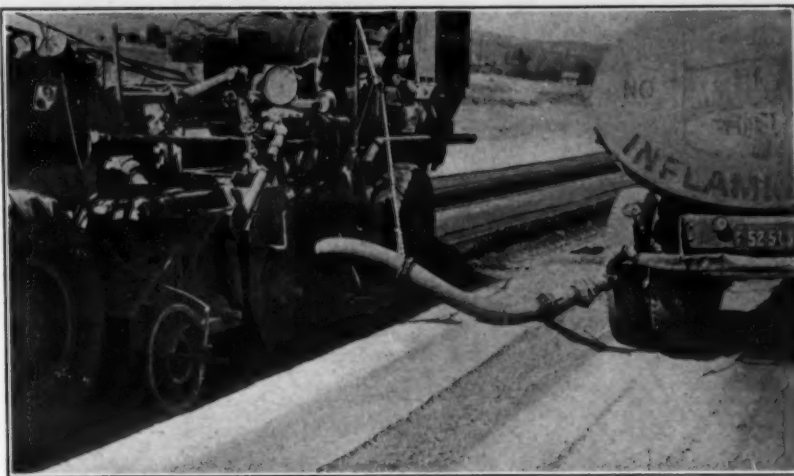
No clearing was required, for the job extended across a cultivated barley field wet and soggy from the unusually heavy rainfall of the 1941 winter season. This wet condition posed one of the major problems of the job, causing extensive delay in the early part of the work. To take care of this condition in the permanent highway, the plans called for many hundreds of feet of concrete pipe drains along the roadway.

Using a truck-mounted crane, Oswald Brothers set to work placing the concrete pipes as quickly as possible. The ground was still soft from rains, but by giving the crane a tug now and then to pull it through the worst places, the ditch was completed and the pipe set. Digging the trench itself helped greatly to dry up the ground surface, and shortly after the concrete pipes were in

place a marked improvement in hauling conditions was noted.

Excavation

Two Caterpillar tractors, a D8 and a D7, were brought in with two LeTourneau 15-cubic yard Carryalls to excavate the 32,000 cubic yards of clay. Hauls ranged from 400 feet to 2,000 feet, with an average of about 900 feet between loading and dumping stations. At the time this excavation was being done, the contractor was also engaged on defense work on street surfacing in Camp Haan and on airport construction in Arizona. The result was a near shortage of construction machines. There was but one thing to do, and Superintendent Johnson did it: he put two of the best operators he could find on the



Road-mixing the soil-cement base on the Camp Haan road in California, using a Gardner traveling mixer with close control of water by the tachometer wheel and the dial showing the gallons of water delivered per minute.

equipment and said, "Let's keep 'em rolling, boys; we want yardage!" The crew and their superintendent

stopped short of nothing to produce that yardage. Careful study of the job soon
(Continued on page 20)

EXCERPT FROM PAGE 62,
Dec. 1941 "NATIONAL
SAFETY NEWS"

61% of all Safety Directors Say— "Use *Preformed* Wire Rope to Reduce Accidents"

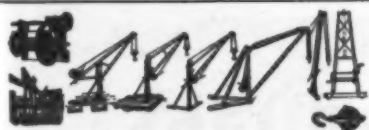
**AMERICAN CABLE
TRU-LAY *Preformed***

When asked, in a survey, how to reduce accidents to workmen handling wire rope, 61% of all Safety Directors said: "Use *Preformed Wire Rope*." American Cable TRU-LAY **PREFORMED WIRE ROPE** means steadier machine operation and greater production. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa. • Atlanta • Chicago • Denver
Detroit • Houston • Los Angeles • New York
Philadelphia • Pittsburgh • San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT



**Complete Line
of
DERRICKS
and
WINCHES**

BASGEN DERRICK CO.
3101 W. Grand Ave. Chicago, Ill.



ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRAATT & CARY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*



The North Carolina State Highway and Public Works Commission sends a load of old highway equipment from the Raleigh Shop on its way in the "Salvage Scrap Metal" campaign.

N. C. Highway Dept. Salvages Metal Scrap

(Photos on page 52)

The State Highway and Public Works Commission of North Carolina is right in step with the national program for the salvage of scrap to be used in the production of steel for victory. Soon after the call came for more scrap iron, word went out to all divisions to collect its scrap for sale and shipment. Already a considerable number of car loads of this scrap material, amounting to more than 4,500,000 pounds, have been shipped, according to W. Vance Baise, State Highway Engineer, and the concerted effort to collect all of it throughout the state for re-shipment to the mills is being continued.

In some states, efforts are being made to salvage steel bridges on discarded rights-of-way. For a number of years, it has been the policy in North Carolina to salvage such bridges at the time they were replaced by a standard-type structure. Therefore, North Carolina roads are totally devoid of obsolete bridges on discarded rights-of-way. It will be recalled that the State Highway Commission maintains all public roads in North Carolina as well as those on the state highway system, and many steel bridges which have proved inadequate on the state highway system have been moved to take care of traffic needs on less important county highways.

New Explosives Act Requires Licensing

On December 26, 1941, the new Federal Explosives Act became a law, placing the manufacture, possession, sale and use of explosives under wartime regulations. This new law (H.R. 3019), which supersedes the 1917 law, is much like it and is administered by the Bureau of Mines.

Contractors requiring the use of explosives for ground clearing, rock work and the blasting of frozen ground, or for any other purpose, come under the requirements of the Act which make it necessary for all manufacturers and users to be licensed by the Bureau of Mines which is rapidly setting up the machinery to effect the purposes of the Act.

ingredients; 2. Vendor's, authorizing the purchase, possession, and sale of explosives or ingredients; 3. Purchaser's, authorizing the purchase, possession, and use of explosives and ingredients; 4. Foreman's, authorizing the purchase and possession of explosives and ingredients and the sale and issuance of explosives and ingredients to employees as at mines, quarries or tunnel operations; 5. Analyst's, educator's, inventor's, and investigator's, authorizing the purchase, manufacture, possession, testing, and disposal of explosives and ingredients.

Licensing agents will be designated by the Director, Bureau of Mines, and will be such persons as are authorized by law to administer oaths. The law states "wherever possible the Director shall select as licensing agents qualified officers or employees of the several states or of political subdivisions or public bodies thereof". Applications for vendor's, purchaser's, and foreman's licenses may be made with any licensing agent. A fee of 25 cents will be charged for each license and the agents are not

entitled to any other compensation from the United States for their services.

The Act requires that a superintendent, foreman, or other duly authorized employee, when licensed, may issue or sell to any employee under him the required amount of explosives needed by that employee in the performance of his duties. The issuing authority must see that any unused explosives or ingredients are returned and that no explosives or ingredients are taken by the employee to any point not necessary to the carrying on of his duties. Violations of any of the provisions of the Act are punishable by a fine of \$5,000, or imprisonment for not more than one year, or both.

Regulations under the Act have been issued by the Director of the Bureau of Mines. These regulations will be amended from time to time.

Help the USO to help the men in the service and those left at home by giving to its War Fund now!

Licenses are of five types: 1. Manufacturer's, authorizing the manufacture, possession, and sale of explosives and



WAR DELIVERIES
fall short if machine output is not fully maintained. For lubrication that promotes sustained full output by **CONSTRUCTION MACHINERY** use...

...SINCLAIR PENNSYLVANIA and OPA-LINE MOTOR OILS,

also specialized gear oils and greases. These lubricants are designed for safe lubrication of equipment in all-out service.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



ALLIS-CHALMERS tractors and Euclid wagons of Calumet Paving Company, Indianapolis, working on a 300,000 cu. yd. job. Sinclair products used.

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE

SINCLAIR REFINING COMPANY (Inc.)

2540 WEST CERMACK ROAD
CHICAGO

10 WEST 51ST STREET
NEW YORK CITY

RIALTO BLDG.
KANSAS CITY

573 WEST PEACHTREE STREET
ATLANTA

FAIR BUILDING
FT. WORTH

STERLING PUMPS

BUILD FOR DEFENSE
with
STERLING PUMPS
HOISTS
and
LIGHT PLANTS

Simple, Dependable, Rugged... the choice of leading contractors everywhere. Write for literature and prices.

STERLING MACHINERY CORP.
405 13 Southwest Blvd. Kansas City, Mo.

New Bridge at Eau Claire On Wis. Strategic Network

Chippewa River Crossed by 962-Foot Bridge on Pile Foundations in Gravel; Had Caisson Trouble at Start

(Photo on page 1)

THE coarse gravel of the bed and banks of the Chippewa River, which is crossed southwest of Eau Claire, Wis., by the new 7.34-mile Belt Line of U.S. 12, the main highway west to St. Paul, Minn., permitted heavy flows of water beneath the cofferdams for the north abutment and the first two piers constructed for the new bridge. This also caused three "blows" in one pier cofferdam. The vibration and compaction of the gravel by pile driving stopped the flow of water beneath the sheet piles and also reduced the inflow of water at the joints of the sheet piling.

The Allied Contracting Co. of Eau Claire moved in on the job on May 8, 1941, and was allowed by the contract 450 calendar days for the completion of the structure.

The Bridge Structure

The bridge consists of two abutments and seven piers, the north abutment being at the Eau Claire end of the bridge. There are five long truss spans between the north abutment and the five piers proceeding across the river at a skew of 24 degrees with the center line of the bridge, then three spans at the south end. These spans, successively from the north abutment, have the following lengths: 149 feet 6 inches, three of 147 feet, one of 146 feet, one of 69 feet 7 inches, one of 85 feet, and one of 71 feet, the last three of steel-beam construction.

The North Abutment

Work on this bridge started with the north abutment. The first operation was to put in a Moretrench wellpoint system pumped by two 8-inch Moretrench pumps. The wellpoints were driven around the cofferdam at a distance of about 10 feet, ringing it completely. The wood sheeting for the cofferdam was driven by hand 1½ feet outside the neat line of the footing to a distance of about 6 inches below the footing. The cofferdam was braced with 6 x 12-inch cross braces and the same size for wales for the cross braces. The area adjacent to the sheeting was excavated by hand just ahead of the driving; but the bulk of the excavation, to within 3 feet of the bottom of the footing, was excavated by a Northwest crane with a 40-foot boom, using a ¾-yard Owen clamshell bucket. The final 3 feet was excavated by hand.

The wellpoints, which were driven to 5 feet below the footing, licked the ground-water proposition; but the surface water stood on the top, so a 4-inch Gorman-Rupp pump was added to remove the surface water.

Thirty-four untreated wood piles were driven under each footing of the north abutment by a 2,400-pound drop hammer, using a Clyde hoist and 50-foot pivot leads. They were driven to a penetration of 23 feet, and then cut off so as to extend 9 inches into the footings.

The two abutment footings each measure 19 x 15 feet, and 3 feet deep. They are reinforced and, combined, required



C. E. M. Photo

Forms for the north abutment of the new Chippewa River Bridge at Eau Claire, Wis., built by the Allied Contracting Co.

a pour of 49 cubic yards of concrete, delivered by truck mixers. To bond the footings with the columns, steel hook bars 4 feet 5 inches long above the concrete and extending into the footing 1 foot 6 inches were set in the footing ahead of pouring.

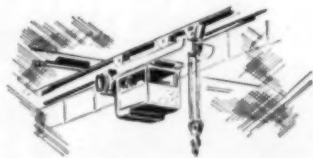
The abutment columns are 15 feet long x 4 feet wide, are straight on the back, and battered on the front. At the top they are reduced to 5 feet 2½ inches long, and are connected at the top by a reinforced-concrete beam 4 feet 9 inches

(Concluded on page 31)

**"This 'once-over' of equipment
pays off in extra
wire rope life"**



"If you're out to get a full measure of service from your wire ropes, it's just good, common sense to check the equipment it runs on. Not just when you get around to it, but regularly—carefully and often. Make a close check-up when a new rope is installed...and then check again, frequently—before the rope starts to show signs of wear. Take a crane, for example with a worn sheave.



It will go right along handling every bit of work it always did. But that sheave will cut and squeeze the wires...and the rope will be through, long before its time.

Here are some of the things to look for—some of the reasons why you often hear an operator blame the rope when it was really his own equipment that shortened its life.

First, see if any sheaves are out of alignment. Then check for deeply worn grooves with a gauge,—like this...

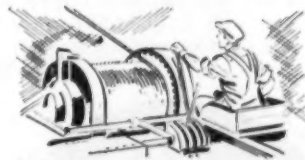


The grooves may be scored by an old rope or one of them may have a broken rim that calls for replacement. Sheaves may turn hard or wobble because of worn or damaged journals. That's tough on your ropes, too.

It's easy to realize the jerk or shock at the fastening when a wire rope whips. Vibration has the same kind of effect, building up a great many small shocks. Too much play in the rope may be to blame...even a bent shaft.



Check for displaced or faulty rope guards. Then find out from the operators if there are any clutches that stick or grab...loose bearings or anything else that causes the pull on a rope to be uneven or jerky.



And remember to consult your wire rope manufacturer on any special problems. There are local representatives near you who have practical experience in ferreting out any "bugs" in your equipment that may be keeping your wire ropes from delivering a maximum of service."



JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities



FRONT END SHOVELS

For Industrial Tractors
Write for Descriptive Circular

White Mfg. Co.

ELKHART

INDIANA



ROEBLING

"Blue Center"

STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

Handling the Aggregates For Big Dry Dock Project

(Continued from page 1)

main storage belt 40 feet above ground elevation. The rate of delivery of the aggregate to the inclined belt is controlled by a guillotine gate. When the second crane is used, material is delivered to the second, or auxiliary, hopper, from which it is transferred by a pair of Haies unloaders to the main feed hopper.

The storage belt, 860 feet in length, spans the entire stockpile area, which includes 210 feet for sand storage, 440 feet for 2-inch gravel, and 210 feet for 1-inch gravel. The entire conveyor equipment, including the inclined feeder belt, storage belt and the inclined belt from the tunnel to the top of the batching plant, are fully enclosed to permit operation in all weathers. A single belt unloader is moved along tracks on either side of the storage belt to permit depositing aggregates at any point in the entire length of the belt. The long belts are each equipped with a weight at one end to maintain a uniform tension.

In order to conserve lumber and yet permit operation of the aggregate recovery system throughout the winter, a sand bin 150 feet long and a gravel bin 300 feet long to permit intensive heating of materials were built. These bins are rectangular, 20 feet high and 14 feet wide. The bins were built of heavy timber construction rather than of steel, to carry out the conservation program as affecting steel, one of the essential war materials. Beneath the entire storage pile and bins is a reclaiming tunnel built on piles equipped with 30-inch belts. The entire belt conveyor system for the aggregate plant was installed by Robins Conveying Belt Co. The recovery gates, at 15-foot intervals in the top of the tunnel, are each surrounded with a steam coil to counteract frost action and to permit free flow of the aggregates. The heated bin material was used during the coldest weather and the warm material from the open tunnel section at other times. A 300-hp oil-fired Cleaver-Brooks boiler produced the required steam for heating the tunnel gates, the aggregate bins at the concrete plant and the concrete mixing water. During the building up of the stockpile, three Caterpillar D8 tractors with LaPlant-Choate bulldozers were used to level the stockpile.

Aggregate Recovery

There is a tunnel belt running from each end of the recovery tunnel toward the middle, delivering to a 300-foot conveyor belt 36 inches wide on a 22-degree incline to the turntable over the top of the steel bins at the concrete mixing plant. The operator at the turntable controls the tunnel belts, starting and stopping them as required, and likewise signals the size of aggregate desired by means of banks of lights located at intervals throughout the tunnel. A red light indicates that sand is to be delivered to the tunnel belt, a blue light calls for 1-inch aggregate, and a green light for 2-inch aggregate. When a change is made from 2-inch stone to a smaller size of aggregate, the recovery belt is always emptied because the weight of the load would cause the belt to sag. The east

recovery belt handles sand and fine stone, and the west belt the two sizes of stone. Telephones connecting with the turntable operating platform are located at convenient points and there are also emergency stop buttons which will instantly shut off the movement of the belts. An interlocking system on the electric control prevents the simultaneous operation of the two tunnel belts, and a relay system, which controls the starting operation of the belts and also contains the interlocking safety switches, permits the picking up of the belt load slowly so that the motors will not be overloaded.

Since the aggregate pile extends nearly 100 feet laterally from the center of the tunnel, it was necessary to provide some means of moving the aggregate back to the tunnel as the stockpile was reduced. This was accomplished by using clamshells to cast the material from the edge of the pile towards the longitudinal center line, and also using the tractors and bulldozers to push the material uphill and into position over the tunnel.

Batching and Mixing

The concrete plant is unusual in design in that three batchers are used, delivering to four double-drum concrete mixers which in turn supply five Pumpcrete units. The plant was set up to produce about 145,000 cubic yards of tremie concrete using gravel aggregate, and an additional 150,000 cubic yards for the floor and walls of the dry dock, which will be poured in the dry, using crushed-stone aggregate. Designed for a 300-cubic yard per hour maximum production, the plant has consistently completed a 2,000-cubic yard pour in 8 to 9 hours with the necessary delays due to starting and stopping and caused by the variation in the distance which the concrete is pumped. The pumping of tremie concrete was continued from early in December, 1941, to about the middle of March, 1942.

The three aggregate bins at the top of the plant have a total capacity of 500 tons. They deliver directly through hand-operated gates to the three Butler

(Continued on next page)

NURSE THOSE HIGHWAYS!

Drastic fund cuts, and freezing of new equipment mean that the job of keeping up highways rests on
REPAIR—MAINTENANCE—SALVAGE.



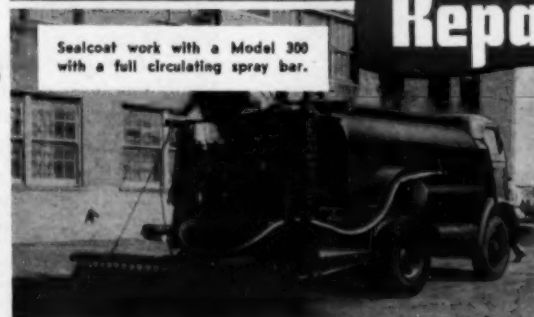
A Model 400 salvaging a farm-to-market road.



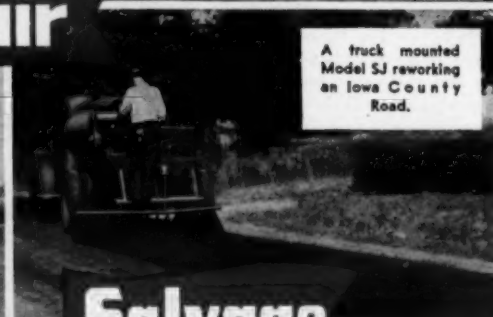
A Model 300 weatherproofing a road in Jackson County, Missouri.



A Model S Tar Kettle patching a state highway in South Dakota.



Sealcoat work with a Model 300 with a full circulating spray bar.



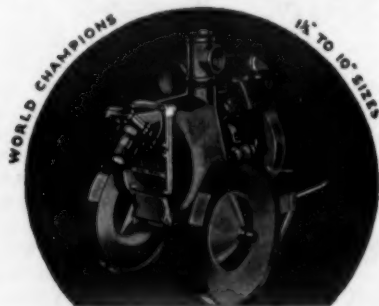
A truck mounted Model SJ reworking an Iowa County Road.



A Model 300 resurfacing over old street car track installations.



Repairing shoulders with a trailer mounted Model SJ.



Only JAEGER Pumps Have All These Features

- **JAEGER PRIMING JET**—Up to 5 times faster prime and re-prime—no adjustments, no need to "gun" engine.
- **POSITIVE RECIRCULATION CUT-OFF**—controlled by flow, not pressure.
- **LONG-LIFE SEAL**—Accessible for inspection.
- **PATENTED SELF-CLEANING SHELL**.
- **EVERY PUMP FACTORY TESTED** for high capacity and pressure.
- **COMPLETE RANGE OF SIZES, TYPES**—3,000 to 240,000 g.p.h.

Send Today for Latest Catalog and Prices.

THE JAEGER MACHINE CO.
781 Dublin Ave., Columbus, Ohio

OTHER PRODUCTS

- Emulsion Spray Units
- Asphalt Distributors
- Maintenance Distributors
- Tar Kettles
- Spray Units
- Asphalt Tools
- Kerosene and Distillate Burners
- Asphalt Buckets
- Tool Heaters
- Tool Boxes

Standard Steel Works
NORTH KANSAS CITY, MO., U.S.A.

Well-Planned Plant Speeds Concreting

(Continued from preceding page)

semi-automatic batchers. Bulk cement is used at the rate of about fifteen carloads per day and is unloaded through two canvas chutes to horizontal spiral conveyors, and is then lifted by bucket elevators to the 350-barrel cement compartment at the top of the mixing plant, the excess cement overflowing to a 3,000-barrel silo. When cement is not being unloaded from cars, it is drawn from the storage silo back into the conveyor system by a lateral spiral screw and delivered to the compartment above. The cement hoppers beneath the main cement storage bin are equipped with vibrators to insure free delivery of the bulk cement to the feeder screw during the batching operations.

Batching is started by pushing two buttons, one of which opens the water valve to the automatic measuring tank, and the other starts the operation of the cement screw at high speed. This screw operates uphill to prevent cement running through when the screw is slowed down automatically toward the end of the batching and then stopped automatically when the proper amount is weighed out. Immediately following the start of the automatic batching operations, the batch man first weighs out the coarse stone, then the sand, and third the fine stone on a three-beam scale equipped with a tell-tale. When the batch man completes weighing out the aggregates, he pushes a button which lights a yellow bulb below to indicate to the mixer man that the batch is ready for delivery to a mixer. Each batcher is equipped with two delivery chutes so that it can serve two adjacent mixers of the battery of four. When a batcher is empty a blue light shows up on the mixer platform.

The interior construction of the concrete plant permits a clear view of the mixer platform and Pumpcrete agitators from the batching floor. For similar reasons the flooring immediately in front of each mixer is replaced with subway grating so that the mixer operators can see the delivery chutes to the Pumpcrete hoppers.

The battery of mixers consists of four 2 $\frac{1}{3}$ -yard Koehring Twinbatch double-drum mixers, which deliver fifty-two



U. S. Navy Photo

General view of the dock area, showing the enclosed aggregate conveyor system, concrete plant and tremie barge.

1.4-cubic yard batches an hour each. There is one operator for each mixer and a foreman who directs the swinging of the delivery chutes which make possible spotting a batch in either of two adjacent Pumpcrete agitators below. On the mixer floor the operators watch the yellow light to indicate from which batcher they should take the next batch. A green light indicates to the mixer operator that the rear batch is being trans-

ferred to the front section of the twin mixer, while a red light indicates that the rear section of the mixer is ready for a new batch.

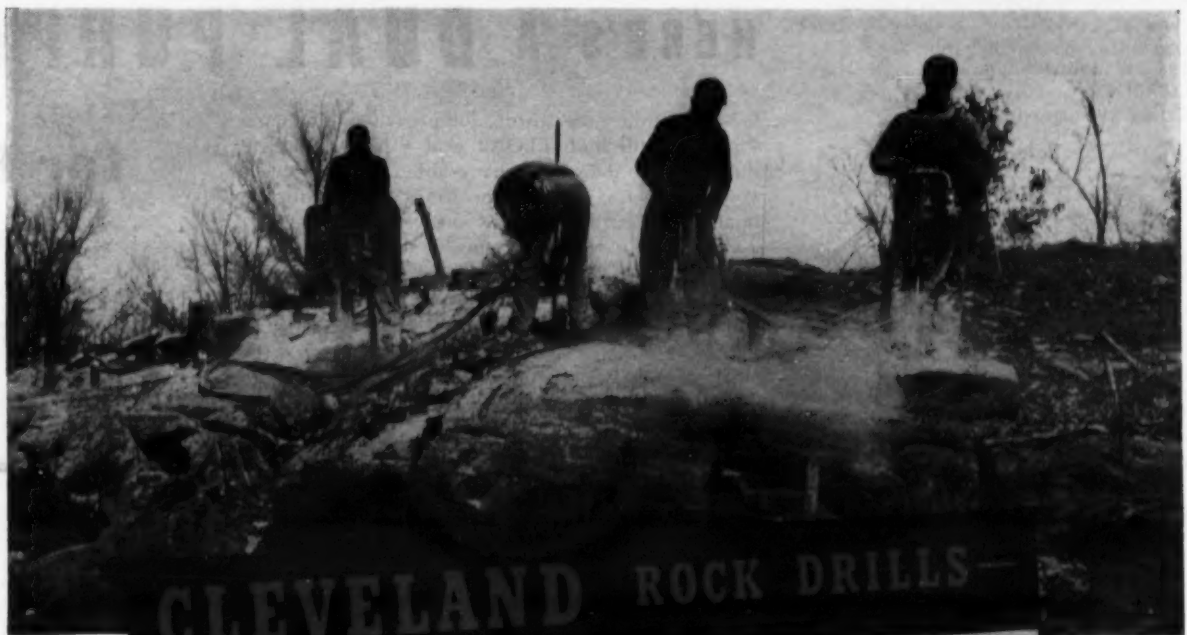
Pumping Concrete

The plant installation of five Rex Pumpcrete machines is supplemented by two spares mounted on skids so that they can be substituted immediately for any of the units which might be taken out

of service for any reason whatsoever. Two flat cars, running on rails in a shallow pit behind the Pumpcrete machines, make it possible to transfer the units quickly and to move a machine needing overhaul to the well-equipped machinist's bench at one end of the building. Concrete from the four twin-drum mixers is delivered to the Pumpcrete agitator hoppers through bar screens with 6-inch openings as protection against any oversize stone getting into the pumps or any one of the five men working on the agitators falling into the hoppers.

The maintenance organization for the Pumpcrete machines consists of three mechanics working at the bench in the rear of the machines, one greaser for each machine, and three clean-up men, who flush the concrete platform at the front of the machines, sweeping aggregates into a concrete pit equipped with an overflow drain. This pit is periodically cleaned of all solids. The almost constant use of the Pumpcrete

(Concluded on page 46)



CLEVELAND ROCK DRILLS

HELPING TO WIN THE WAR

★ Throughout the country, and in the islands that now form the outposts of American defense, Cleveland rock drills are doing their important part in the building of roads, air bases, gun implacements, and fortifications. These projects are vital to the system by which we shall protect ourselves until barbarous Axis nations are finally disarmed and forced back within their own borders. The work must be done well, and with dispatch, so it is fitting that Cleveland rock drills are constantly being called upon to do their part in the nation's big job. Drills for this work must operate in extremes of weather conditions, from the frigid climate of Greenland to the hot and humid weather of the South Sea Islands. They must be fast, reliable, and rugged. Our armed forces know they can depend on Cleveland Hand Sinkers, Paving Breakers, Tampers, Diggers, Wagon Drills — and so can you! We will place Cleveland Drills on your job on a trial basis. Simply tell us the type and size, or write us about your drilling conditions. May we send a catalog?

BRANCH OFFICES

Birmingham, Ala.	Dallas, Texas	Philadelphia, Pa.
Berkeley, Calif.	Detroit, Mich.	Pittsburgh, Pa.
Boston, Mass.	El Paso, Texas	Richmond, Va.
Buffalo, N. Y.	Ironwood, Mich.	Salt Lake City, Utah
Butte, Mont.	Los Angeles, Calif.	St. Louis, Mo.
Chicago, Ill.	Milwaukee, Wis.	Victor, Colo.
Cincinnati, Ohio	New York, N. Y.	Wallace, Idaho
		Winchester, Ky.

CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby St., Vancouver, B. C.
Whitehall Machine & Tools, Ltd., Galt, Ontario

DID YOU GET YOUR COPY OF THE DRILLER'S HANDBOOK?

It is chock full of hints that will help you get more work out of your air tools, and that will enable you to make them last longer. Write stating the sizes and types of rock drills you are now operating, and a copy will be sent postpaid without charge.

VIBER COMPANY
CONCRETE

VIBRATION

MOST PROFITABLE FOR REINFORCED CONCRETE BUILDING CONSTRUCTION

When the job calls for mass vibration — the Viber Vibrator at work above is your best bet. Especially made for walls over 10 inches thick, foundations, large girders, thick floor slabs, columns . . . large reinforced concrete bridges, grade separations, concrete floor systems, concrete arches and rigid frame structures . . . In a word, for all concrete with large aggregate and low water-cement ratio.

Write for complete VIBER data TODAY!

VIBER COMPANY
726 SO. FLOWER STREET
EUREKA, CALIFORNIA

THE CLEVELAND ROCK DRILL COMPANY
Cable Address: ROCKDRILL • CLEVELAND, OHIO
LEADERS IN DRILLING EQUIPMENT

Fast Batching Plant For St. Cloud Highway

**Hallett Construction Co.
Builds New Lane Adjacent
To Old Widened Slab Which
Left Narrow Dividing Strip**

(Photos on page 52)

THE new location of U.S. 52 through St. Cloud, Minn., is along an existing concrete paved street on the west edge of the city where sufficient right-of-way could be acquired to construct a new 24-foot pavement and widen the old 18-foot pavement 6 feet, still leaving a 2-foot island between the two pavements to divide opposing traffic. The contract for this work was awarded jointly to Hallett Construction Co. of Crosby, Minn., and Megarry Bros. of St. Cloud, Minn., and included 2.2 miles of highway construction in addition to a 369.5-foot overhead bridge at the west end of the job. The two contractors bid the job together at \$194,502 and, receiving the award, Hallett did the paving and Megarry the grading and structure.

The Batching Plant

The outstanding feature of the paving was the fast batching plant located about 0.7 mile north of the middle of the paving job. A large area was available on the east side of the street where sufficient stockpiles of aggregate could be maintained to insure continuous operation. The contractor operated his own aggregate-processing plant where sand and gravel were stockpiled the required 12 hours for uniform moisture content before being brought to the site of the batching operation.

The aggregate was rehandled from the stockpiles by a Northwest crane which loaded the wood bins over the Johnson weighing batchers. The 2-batch trucks backed under the aggregate batching plant and, having received the two batches of fine and coarse aggregate, pulled out about 75 feet to a small platform with steps upon which the truck driver climbed and shoveled the batch to spread it uniformly across the bed of the truck. He then drove the truck ahead another 150 feet to a depressed planked driveway adjacent to a railway siding where a dock 1½ freight cars in length was provided for unloading bulk cement from two box cars at a time.

Two sets of wheelbarrow scales were set in the dock for weighing the rubber-tired buggies of cement before they were wheeled to two counterbalanced traps for delivering the cement to the batch

trucks below. The counterbalance consisted of welded channels forming two box girders for each trap and connected beyond the dock by a metal plate with corrugations on the top. The box girders were formed like flattened Z's and were pivoted just in front of the cement dock. Thus, when the buggy with the cement was wheeled onto the trap, the weight was sufficient to depress it to a horizontal position and it was held there by the counterweight coming up against the underpart of the dock. A canvas chute just long enough to reach from the sheet metal hopper, into which the buggies were dumped, to the top of the aggregate in the batch truck prevented spillage unless the buggies were dumped too rapidly, or too enthusiastically, in which case the cement would shoot over



C. & E. M. Photo
A convenient pedestal mounting for the vibrator speeded the work of consolidating the concrete at the joints.

the sides of the truck and be wasted.

Two men and two buggies were worked from each of the two box cars at the cement dock. As the batch truck drove away from the cement dock it stopped at another platform where an extra man stepped onto the truck and covered the cement with aggregate to prevent its blowing during the haul to the paver. The hauling was somewhat hazardous as it was necessary to cross several railroad tracks and a main east and west federal highway with rather heavy traffic.

Fine Grade and Forms

The contractor used a Caterpillar Thirty with a rotary scraper to remove excess dirt from the grade as it was checked by the fine-grade crew. A Ted Carr Formgrader was used to cut the form trench ahead of the setting crew of two form setters and two helpers who placed the Metaforms in position to grade and line. As soon as the forms were placed and staked, a Warco grader powered by a J. I. Case engine moved

(Concluded on page 37)

HERE'S A DUAL PURPOSE MACHINE

for FINISHING

Concrete Slabs

Below—Whiteman Finisher with Floating Trowels



ONE machine—the sturdy, job-proved Whiteman Finisher—will both FLOAT and FINISH heavy-duty concrete slabs. Interchangeable trowels enable your men with the one operating unit to—first: float even “hard-to-handle,” heavy-duty concrete and leave a perfect float finish; second: quickly change trowels and machine finish the floor to a dense, hard, level area free of voids or laitance, producing a job far superior to slow hand finishing.

ONE machine with two sets of trowels does both your float and finish work.

To FLOAT Your Heavy-Duty Slabs

When you are ready to float your heavy-duty concrete slabs, attach the “Heavi-Duti” FLOAT TROWELS (1½” x 10” x 18”) to your Whiteman Finisher. As your machine glides over the slab it produces a perfect float finish at high speed with the strong, broad trowels, which lay flat on the concrete. Whiteman machines with “Heavi-Duti” Float Trowels will cover 1,000 sq. ft. in as little as 15 minutes.

To FINISH Your Heavy-Duty Slabs

When you are ready to finish your concrete slabs, put the easily-attached “FINISH” TROWELS on your Whiteman machine. These lighter, flexible and adjustable blades (17-gage steel, 6” x 18”) bring up the surface in a hurry—give you a harder, more dense floor that costs less to finish, wears longer.

If you have a Whiteman Finisher with standard “Finish” trowels, the new “Heavi-Duti” Float Trowels are available at very low cost.

TWO Sets of Trowels ONE Machine

These two sets of trowels (“Heavi-Duti” float type described at upper left; “Finish” type described opposite) permit you to both FLOAT and FINISH heavy-duty concrete slabs with a single machine. The Whiteman machine does both jobs quicker, producing a better floor at greatly reduced cost. Can you afford to miss these economies?

WHITEMAN Portable Rodding Machine

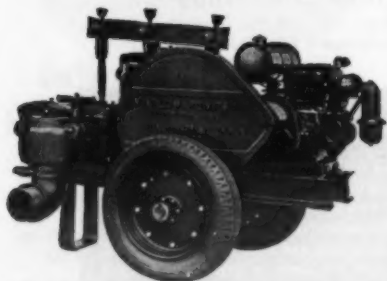
screeds slabs faster, at lower cost. The power-operated rod sticks (screeds) simultaneously level and condense even dry low slump concrete with ease—leaving a pour ready, when sufficiently set, for final finish by the WHITEMAN Finishing Machine.

Write TODAY for full information on money-saving WHITEMAN Portable Rodding Machine.

Write or wire your distributor or communicate direct with us.

WHITEMAN MANUFACTURING COMPANY
Dept. C, 3249 Casitas Avenue
LOS ANGELES, CALIFORNIA

4" Single Mud Hog Pump on Pneumatic Wheels



The “Old Reliable” Mud Hog brought up to date.

Gearing enclosed—running in oil.

All cut gearing.

Die-forged crankshaft in pump.

Available in the ball valve Force type, or the flat valve Open Discharge.

Send for Bulletin No. CEM-40-D.

MARLOW PUMPS RIDGEWOOD, NEW JERSEY



Portable Rodding Machine

Send Your Requirements For Equipment to WPB

The Bureau of Governmental Requirements of the War Production Board requests that all state, county and municipal governmental agencies file with the Bureau a statement on highway equipment covering the following:

1. All highway equipment now in use, date of purchase, and condition.
2. Mileage of roads you are now maintaining.
3. Contemplated purchases for 1942, including grader blades.
4. What applications for priority

rating you have already submitted.

State, county and township officials who have not already answered this questionnaire, which was originally sent out in January, should do so at once, and thereby provide the cooperation which local governments have repeatedly pledged.

New Catalog on Buckets

Erie general-purpose clamshell buckets are adaptable to a wide range of clamshell work, meeting practically every requirement of the general contractor from excavating to the rehan-

dling of compact materials. According to the manufacturer, the Erie Steel Construction Co., Erie, Penna., it is a fast-working bucket designed to operate at each grab. In rehandling service it is rarely necessary to use counterweights and digging teeth and the bucket is usually reeved the minimum parts of line, reducing the cable overhaul and increasing the operating speed.

A catalog recently issued by this company describes its clamshell buckets in detail and contains information on other types of Erie buckets, including dredging and hard digging buckets, material-handling clamshell buckets, single-line

clamshell buckets, and barge-type rehandling clamshell buckets, as well as the Erie Strayer electric bucket. Copies of this catalog may be obtained by writing direct to the manufacturer.

Metallizing Co. Moves Office

The Metallizing Co. of America, manufacturer of the Mogul metallizing gun, metallizing wire and accessory equipment, has announced the removal of its Chicago general offices and mid-western warehouse to new and larger quarters at 1330 West Congress St., Chicago, Ill.



OFF TO THE FIGHTING FRONTS

THIS vast war has a thousand battle-fronts on which "Caterpillar" Diesel-powered equipment can help — and is helping.

Whereas most machines are built for but one purpose or field, "Caterpillar" Diesel Tractors, Engines and Electric Sets are born with the versatility to handle innumerable jobs in a wide range of activities: On construction projects for carrying out the broad strategies of war; in industries providing needed war materials and implements; along the supply lines; and on the actual fighting fronts themselves.

"Caterpillar" products are ideally suited to this kind of war — a war of machines operated by a fighting force of highly trained specialists.

And since they are fundamentally sound in their present design — proved over and over to do a good job no matter what the assignment — there is no delay in turning "plowshares into swords" . . . no loss of time for factory retooling or change-over from one type of production to another. The "all-clear" signal has been set — and spiked down — toward the all-out effort of winning the war!

SOME "CATERPILLAR" BATTLE-FRONTS

TRACTORS AND MOTOR GRADERS: Building and maintaining basic, training and combat flying fields; naval bases and shipyards; military bases, roads, cantonments and proving grounds; coast defenses; aircraft, engine, ordnance and munitions plants.

Helping the oil, lumber, mining, steel and other basic industries to provide vitally needed raw materials.

Aiding the transportation of supplies.

Erecting field fortifications and gun emplacements; throwing up earthworks and tank obstructions; filling bomb craters; clearing spaces for troop concentrations and movements; digging trenches; building dams for water supplies and defense floodings; moving heavy artillery, disabled tanks and other fighting equipment in combat zones.

ENGINES AND ELECTRIC SETS: Providing light and driving machinery on construction, oil drilling, mining and other projects; in war-industry factories, sawmills, cotton-gins, machine and repair shops.

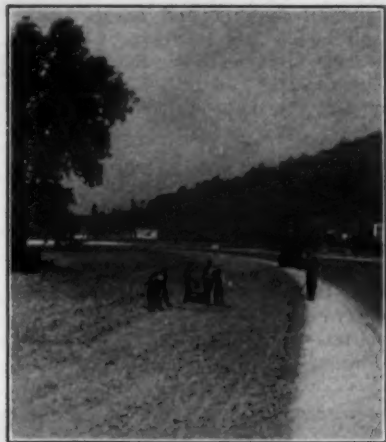
Providing light and power for air, naval and military bases, anti-aircraft defenses.

Providing propulsion power for many types of small essential watercraft; auxiliary and emergency light and power for combat, supply and other larger ships.

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

TO WIN THE WAR: WORK—FIGHT—BUY DEFENSE BONDS!



Seeding operations on Route 52 in Scioto County, Ohio.

Seeding and Sodding Along Ohio Highway

A sandy soil which eroded very badly was corrected by a 3.617-mile roadside-development project on State Route 52, in Scioto County, Ohio, handled with speed and efficiency by E. H. Birkmeyer, of Coldwater, Ohio, to whom this contract was awarded for \$10,807. The project consisted mainly of seeding, with sod laid along all masonry ditches to stop undermining of the ditch and to eliminate the necessity of costly cleaning.

The renovating soil specifications required loosening of the soil for a minimum of 4 inches, hand raking, and the removal of all stones and other debris to prepare a proper seed bed. The existing soil was used and only the poorest areas were excavated to a depth of 3 inches and replaced with good top soil to bring the area up to grade. For the most part, however, the seed bed was a sandy loam.

When the area had been properly loosened and hand-raked, agricultural hydrated lime was added at the rate of 100 pounds per 1,000 square feet. After a period of 48 hours, bone meal and 4-12-4 commercial fertilizer were added, at the rate of 10 pounds per 1,000 square feet each. Then seed, at the rate of 4 pounds per 1,000 square feet, was sown. On the berms and lawn areas the seed was a lawn mixture but on slopes red clover and hairy vetch were added. The seed was applied in two directions to secure a thorough even coating of the entire area which was rolled immediately, followed at once by the placing of a straw mulch. No area was left unprotected for more than 8 hours after seeding. The straw mulch was held in place along the berm by the string and twine method which proved very effective, keeping the areas

protected right up to the pavement edge. Because of the large amount of traffic on this road, the contractor had considerable difficulty in keeping the straw mulch in place, but this was overcome by putting a double line along the pavement.

Rain and high water in the Ohio River delayed work at the start of this project but the contractor made up for lost time by putting on another Superintendent and working a double crew, and by the use of mechanical equipment, wherever possible, to speed things up. Harrows and disks were used to loosen the ground, a bulldozer worked on the grading, and a large shovel was used in loading the top soil.

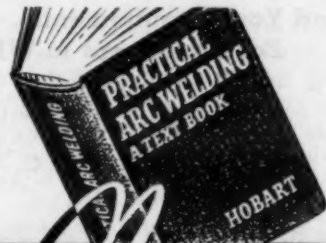
Because of his efficient work and his cooperation with the Department of Highways engineers, E. H. Birkmeyer, the contractor for this project, was nominated for one of CONTRACTORS and ENGINEERS MONTHLY's Roadside Development Awards. The work was done under the supervision of W. J. Garmhausen, Division Landscape Architect of

the Ohio Department of Highways, for which Dallas D. Dupre, Jr., is Chief Landscape Architect.

Technical Data Condensed

A 64-page hand book packed with essential basic information in mathematics, physics, chemistry, mechanics and engineering, including figures, theory, definitions, laws, formulae, simple calculation, diagrams and tables, has been brought out under the name "Technical Data Hand Book". Prepared especially for engineers, designers, chemists, mechanics and technical students, this 8½ x 5½ fully illustrated book should find a place on the desks of all of those who are continuously engaged in the use of data of this type, as the information contained in the book is basic and will not go out of date.

The book is published by The Norman W. Henley Publishing Co., 17-19 West 45th St., New York City, and is available in spiral or cloth binding at \$1.00 and \$1.50 respectively.



GET THIS *New* HANDBOOK OF ARC WELDING

Covers all phases of arc welding. Explains newest techniques, materials, procedures. Makes an expert better, gives beginner all information he needs. **ORDER NOW! \$2.00**

HOBART

"One of the World's Largest Builders of Arc Welders"

FOR OFF-THE-ROAD HAULING

-You need MORE than "Heavy Duty" Trucks



... You need

WALTER TRACTOR TRUCKS
with
4-POINT POSITIVE DRIVE

A truck that is rated "heavy duty" for highway hauling, too often fails in off-the-road work. Here, loads are heavier, pulls are tougher, riding surfaces are poorer. Under such conditions, "rated horsepower" means little. What counts most are *delivered power—traction—maneuverability—ruggedness—special engineering* . . . and you get them ALL in WALTER TRACTOR TRUCKS!

Most important, you get WALTER 4-Point Positive Drive, which gives you FOUR powerful driving wheels, with 100% traction in each. Patented Lock Differentials proportion the torque to each wheel

according to its traction, putting the most power where it is most needed. That's why WALTER TRACTOR TRUCKS can be depended on to keep loads moving in any weather, under any running conditions. And it explains their great reputation as Snow Fighters. Before buying another truck for heavy off-the-road hauling or winter snow removal, write for literature giving full details about WALTER 4-Point Positive Drive Trucks.

WALTER MOTOR TRUCK CO.
1001-19 IRVING AVENUE, RIDGEWOOD, QUEENS, L. I., N. Y.



THE STRONGEST GEARED POWER FOR ITS WEIGHT IN THE WORLD

COMPACT—POWERFUL—SAFE
"For use where power is not practical or available"

Manufactured in 2, 5 and 15-Ton Sizes.
For capacity comparison, ½" cable used:

2-Ton "Lightweight"	75 ft.
5-Ton "General Utility"	250 ft.
15-Ton Triple-Geared "Special"	1200 ft.

Patent instant gear change and positive internal brake that never fails, and will lock load.

Gear Ratios	Weight	Seattle Price, f.o.b.
2-Ton 4 & 22 to 1	60 lb.	\$ 50
5-Ton 4 & 24 to 1	110 lb.	\$ 75
15-Ton 4, 19 & 100 to 1	680 lb.	\$250

BEEBE BROS.

2724 6th Ave., So., SEATTLE, WASH.
Warehouse stocks for dealers' supply: Seattle—Chicago—Brooklyn—Houston. Complete literature and List of Dealers in Principal U. S. Cities and Foreign Countries Gladly Mailed.

Portable Power Plants

A new bulletin on Katolight portable power plants, in 7,500, 10,000 and 15,000-watt capacities, has recently been issued by the Kato Engineering Co., Mankato, Minn. These plants, which are designed to furnish power for lighting and the operation of electric tools on construction jobs as well as for standby and emergency service, are available in self-excited models or with a separate exciter attached.

Copies of this new bulletin, Form 1241, may be secured by interested contractors and state and county highway engineers direct from the manufacturer.

Unenforceable Contracts

A very instructive and helpful pamphlet "Contracts You Can't Enforce" has recently been issued by the Business Development Department, The Corporation Trust Co., 120 Broadway, New York City. Its 22 pages are filled with cases

where contractors had contracts they thought would stand up in court but on which they found they could not collect. The final 3 pages of the pamphlet are devoted to the service furnished by The Corporation Trust Co. in protecting contractors when operating in states outside of those in which they are incorporated.

Copies of this booklet will be furnished free on request by applying to The Corporation Trust Co. and mentioning this review.

Chip and Sand Spreaders

Chip and sand spreaders, one model of which will lay down a heavy blanket of sand and another spinner model of which will distribute cinders or chips over an icy highway, are described and illustrated in considerable detail in a folder which may be secured from Highway Equipment Co., Inc., Cedar Rapids, Iowa. These models are power or hand-operated and come in four variations.

SULLIVAN EQUIPMENT

SPEEDS

CONSTRUCTION for VICTORY

Our war effort demands new and accelerated schedules in every phase of construction and all practical means must be employed to increase the productivity of each man, machine, or tool.

Every compressor, rock drill or hoist that can be made to operate better or last longer, will avoid the present purchase of new equipment urgently needed elsewhere.

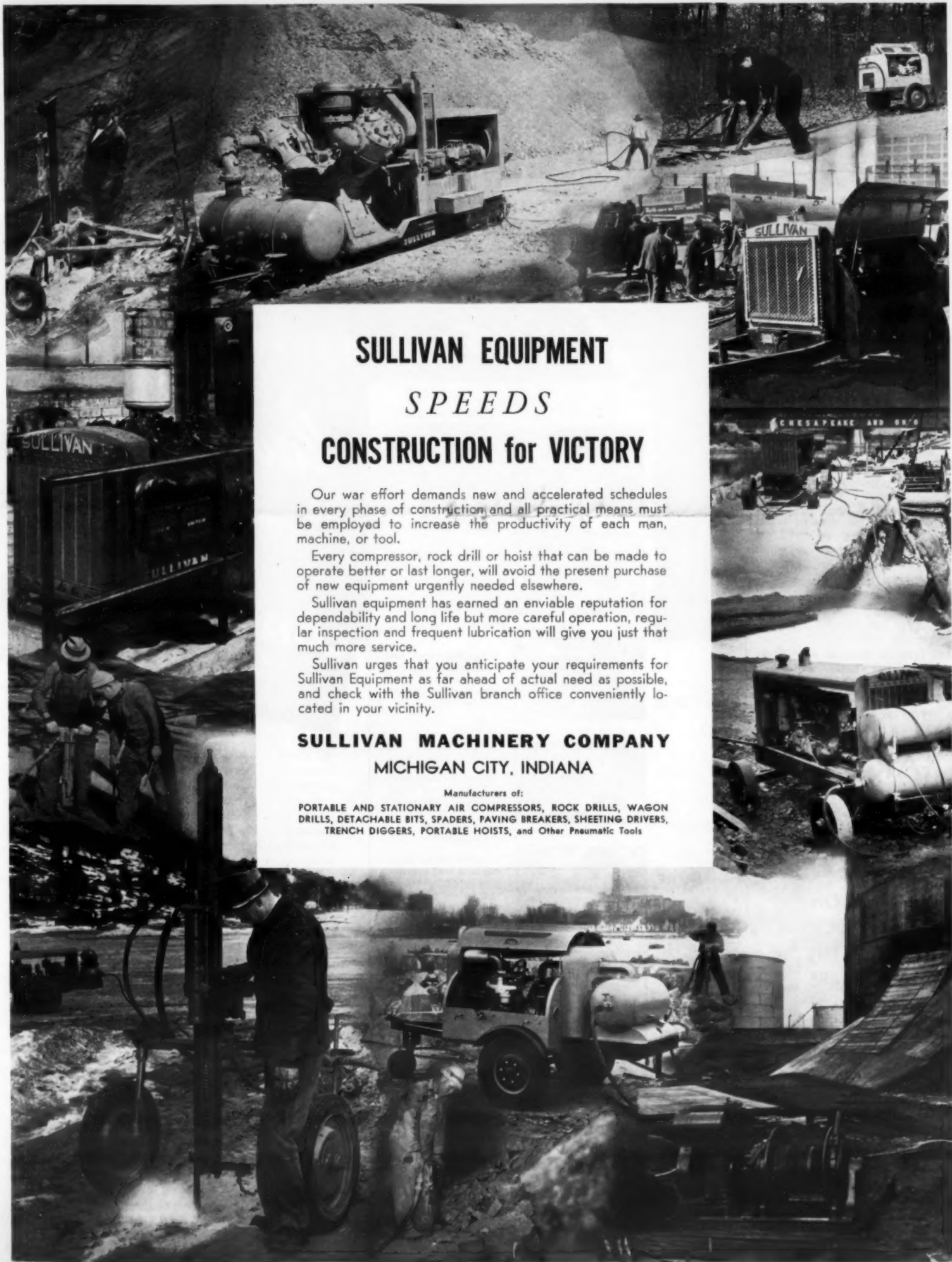
Sullivan equipment has earned an enviable reputation for dependability and long life but more careful operation, regular inspection and frequent lubrication will give you just that much more service.

Sullivan urges that you anticipate your requirements for Sullivan Equipment as far ahead of actual need as possible, and check with the Sullivan branch office conveniently located in your vicinity.

SULLIVAN MACHINERY COMPANY MICHIGAN CITY, INDIANA

Manufacturers of:

PORTABLE AND STATIONARY AIR COMPRESSORS, ROCK DRILLS, WAGON DRILLS, DETACHABLE BITS, SPADERS, PAVING BREAKERS, SHEETING DRIVERS, TRENCH DIGGERS, PORTABLE HOISTS, and Other Pneumatic Tools



Whitney Point Dam Closure Operations

Otselic River Diverted Through Horseshoe Conduit; Final Operations on Part Of Binghamton Project

ON June 6, 1941, the diversion of the flow of the Otselic River from its stream bed at the east end of the 2,500,000-cubic yard rolled-earth embankment at Whitney Point Dam, 24 miles north of Binghamton, N.Y., marked the final stage of construction of this unit designed for the protection of the urban centers in the Upper Susquehanna Basin, of which Binghamton, Johnson City and Endicott, with a combined population of 106,460, are the largest. They are located on the broad flood plain at the junction of the Chenango and Susquehanna Rivers, the Otselic being a part of the Chenango River system. Work on the project was started September 9, 1938, by the contractors, The Hunkin-Conkey Construction Co., and Shofner, Gordon & Hinman, of Cleveland, Ohio, and this flood-control unit was ready to handle the 1942 spring freshets of the Otselic River.

The dam consists of a rolled-earth embankment rising 90 feet above the valley floor, the main embankment being 1,000 feet long with dike sections at either end of the dam, the total length of fill being 5,000 feet. The cut-off or core trench, 15 feet deep and 40 feet wide at the bottom with slopes of 1 on 2, is located along the center line of the dam in the valley bottom and along the abutments, and is filled with impervious material. The dam is constructed of five classes of material, graded from impervious core material to a pervious outer layer. All of this material was secured from the spillway cut in the left or east abutment. A sand and gravel filter and rock fill was placed at the downstream toe of the dam for drainage.

The spillway is located in rock in the east abutment and consists of a curved channel approach with a weir spillway discharging through an open race channel into a stilling basin and then through an open channel into the river below the dam. The spillway is 220 feet wide and has a capacity of 75,000 cubic

feet per second with a head of 21 feet.

The outlet conduit which will drain the reservoir at a controlled rate after the crest of a flood has passed from the rivers below is a 13-foot horseshoe conduit, approximately 1,425 feet long, tunneled through the east abutment beneath the spillway. The discharge is controlled by three 5 x 10-foot gates installed in the control house at the upstream end of the conduit. The conduit and the spillway discharge into a common stilling basin.

The reservoir formed by Whitney Point Dam will extend about 15 miles northward from the dam and has a storage capacity of 87,600 acre-feet, equivalent to 6.4 inches of run-off from the 255 square miles of drainage area. The reservoir pond will have an area of



C. & E. M. Photo
A Lorain 77 shovel and dragline stripping the mid-section of Whitney Point Dam site and loading to a fleet of Euclids.

3,070 acres.

The Two-Stage Cofferdam

The cofferdam at the upstream toe of the dam to divert the waters of the Otselic River through the tunnel was built in two stages. The first stage involved a low cofferdam built of rock selected

from the quarry and dumped in place. This stone varied from 35 pounds to 1,000 pounds, with no shale nor any stone smaller than the minimum mentioned. The first-stage cofferdam rose from the stream bed, Elevation 944 to Elevation 965, with slopes of $1\frac{1}{2}$ on 1

(Concluded on page 34)

7 ways to help you make equipment

THIS SERVICE HELPS YOU TO

Locate high maintenance items by suggestions for accurate cost accounting records.

Promote longer ring and piston life by determining safe oil drain periods.

Lengthen valve and ignition system life by scientifically determining engine adjustments.

Reduce road failures by suggesting practical preventive maintenance methods.

Increase wheel bearing and transmission life by recommending lubricants and maintenance schedules.

Stretch tire mileage by analyzing and suggesting ways to correct causes of tire wear.

Get more power . . . use less fuel by recommending adjustments to take full advantage of available gasolines or Diesel fuel.

last longer...

STANDARD OIL'S FLEET CONSERVATION SERVICE

● HERE's why Standard's Fleet Conservation Service has been so quickly organized and is so completely fitted to help you in this emergency.

For some years, a staff of Automotive Engineers has been located in principal centers throughout the Middle West. Their job has been to work with users of Standard Oil fleet products to secure the greatest possible economy of operation with gasolines and Diesel fuels, motor oils and chassis lubricants, tires and batteries. Their experience has covered every angle of fleet operation. They have had an opportunity to analyze cost records, maintenance procedures, and operating difficulties, not on one or two fleets, but on hundreds of them.

Backed by this experience and training, this corps of Engineers is ideally prepared to take over the highly important job of helping you conserve equipment now.

Conveniently located near your headquarters in the Middle West, one of these Engineers can discuss your problems with you personally. This service costs you nothing. Write Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago, Ill.

OIL IS AMMUNITION USE IT WISELY

STANDARD OIL COMPANY (INDIANA) AUTOMOTIVE ENGINEERING SERVICE

LOWERS
MILEAGE
COSTS

MARVEL

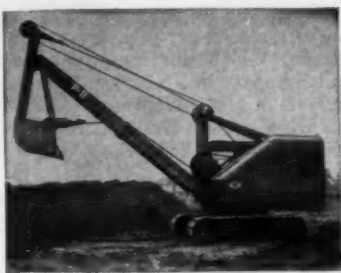
VIBRATORS

ARE
WORKING ON
VITAL PROJECTS
ALL OVER THE
UNITED STATES.

WRITE TO

Marvel Equipment Manufacturers, Inc.
234 So. Michigan Ave. Chicago, Ill.





The new P & H 655A trench hoe.

New 1½-Yard Trench Hoe

Based on the already accepted P & H 655A shovel chassis, a new trench hoe with the same model number has been announced by the Harnischfeger Corp., 4419 W. National Ave., Milwaukee, Wis. Both machines are built on the same frames and have the same capacity, differing in their digging mechanism.

The trench hoe is not merely an attachment as its mechanism is a new development in trench-hoe operating design. Faster digging is accomplished by a newly developed powerful gear-driven booster device with positive primary chain drive. This auxiliary drum unit also speeds the dipper reversing action and provides smoothness and accuracy in controlling the dipper.

The 1½-yard struck-measure dipper will excavate to a depth of 22 feet, has a reach of 37 feet and a dumping height of 16 feet. This new trench hoe is of all-welded alloy-steel construction reflecting simplicity and ruggedness.

Complete information on this new trench hoe will be furnished promptly to readers writing direct to the manufacturer and mentioning this item.

Preventive Maintenance

In the interest of better maintenance, General Motors Truck & Coach Div., Yellow Truck & Coach Mfg. Co., Pontiac, Mich., has prepared a booklet presenting a few of the "whys" of preventive maintenance service, with the hope that they will serve to bring out more forcibly the fallacy of deferred maintenance practice and point the way toward better analysis of the underlying causes of better maintenance experience.

Recommending that all vehicles receive some form of preventive treatment each 1,000 miles throughout the life of the vehicle, or on low-mileage vehicles every thirty days, the booklet asks and answers such questions as "Why lubricate a chassis?", "Why tune an engine?", "Why align front wheels?", and many others.

All those interested in getting maximum and lasting performance from their trucks will find this booklet helpful. Copies may be obtained by writing direct to the manufacturer and mentioning this item.

Division Vice Presidents

Gar Wood Industries, Inc., Detroit, Mich., has announced that the following men have been elected Vice Presidents of their Divisions: W. H. Hammond, Sales Manager, Hoist, Body and Tank Divisions and Director of Branches; J. B. Haile, General Manager, Road Ma-

chinery Division; and G. E. Robinson, Manager, Winch Division. These newly elected Vice Presidents will continue their duties as Managers of their Divisions.

Chicago Office Closed

Because its manufacturing activities have been given over entirely to the increased production of magnetos for war-effort equipment, the Eisemann Magneto Corp., New York City, has closed its Chicago Sales Office, 910 S. Michigan Ave., on April 15. In addition to the increased production of magnetos, the Corporation has also undertaken the manufacture of other items for the Government.

Oliver S. Stanley, Chicago District Manager for many years, is no longer connected with the Corporation. Ralph Dinnsen and Bill Wills, maintenance and service representatives, will continue to cover the Chicago and Western territories to insure thorough field maintenance of Eisemann magnetos.

AIR WHERE YOU NEED IT QUICKLY • EASILY — AT MINIMUM COST

A very important feature of this compact unit is its extreme light weight. Without sacrificing an ounce of pressure or a day of hard-hitting useful life SCHRAMM gives you a compressor with a weight saving up to 40%. Quickly and easily moved from job to job—and gives you "AIR WHERE YOU NEED IT,"—at low cost.



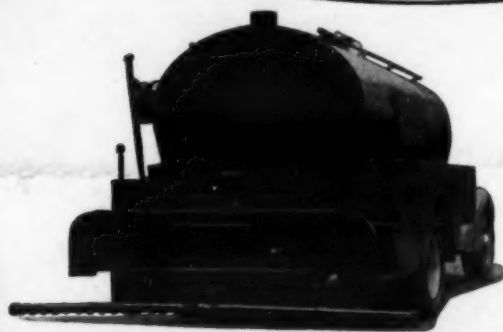
Model No. 105 Deluxe—Gasoline Drive

Write for Catalog 42-P

SCHRAMM, INC. WEST CHESTER, PA.
DEALERS IN PRINCIPAL CITIES

LITTLEFORD EQUIPMENT KEEPS THEM ROLLING

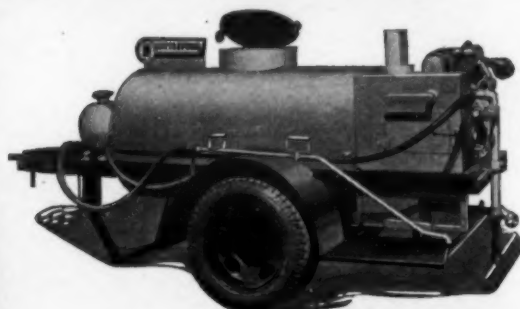
WITH MODERN BLACK TOP ROAD
CONSTRUCTION EQUIPMENT



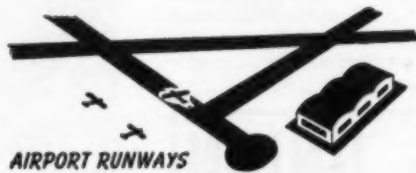
"Spray Master" Pressure Distributor



No. 84-HD Kettle



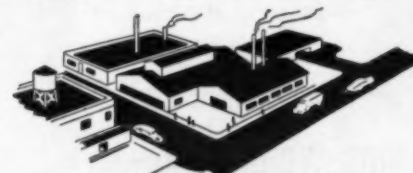
No. 101 Utility Spray Tank



AIRPORT RUNWAYS



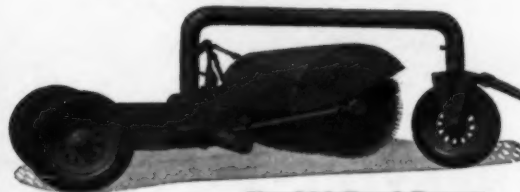
STRATEGIC ROADS, HIGHWAYS AND STREETS



ORDNANCE AND DEFENSE PLANTS



CANTONMENTS



No. 106 Road Broom

A UNIT FOR EVERY JOB

If it's for the construction or maintenance of Airport Runways, Strategic Roads, Highways and Streets, Ordnance Plant or Cantonment Streets and Parking Areas, Littleford Black Top Equipment will handle the job in less time and cost.

This modern designed Equipment is efficient in operation, accurate in application and sturdy in construction. "Keep them Rolling"—use Littleford Black Top Construction Equipment for better roads.



LITTLEFORD

Littleford Bros., Inc.
485 E. Pearl St., Cincinnati, Ohio

SAND'S-STEVEN'S Line & Surface LEVEL



Endorsed and Adopted by Road
Builders and Contractors

Level is easily and quickly attached to line. Special feature construction prevents accidental detachment from line. Construction is sturdy, and accuracy guaranteed.

SAND'S LEVEL & TOOL CO.
8321 Gratiot Ave. Detroit, Mich.

Base Stabilization On Access Road Job

(Continued from page 9)

showed the shortest possible hauls which could be made with the machines. By cutting out high places here and there, the ground was soon level enough to take advantage of faster tractor speeds. To cut down the amount of lost time due to breakdowns or repairs, the equipment was serviced with the best fuel, lubricants and accessories obtainable.

On cable-operated equipment, such as the Carryalls, preformed wire rope was used exclusively. Oswald Brothers found that this type of rope added about 35 per cent to the working life of the rope over non-preformed rope of the same size. IWRC 6 x 19 preformed cable was used. Its construction made it more tractable and therefore easier to install at the outset, and because of its freedom from inner torsional stresses, it spooled evenly on the power control winch drums and was not so subject to crushing. The contractor's close attention to factors such as this resulted in maximum output from the machines.

Near the lower end of the project a grade separation, designed to route traffic at high speed to and from the main highway, required several thousand cubic yards of fill. One of the approaches was built with excess excavation which had been purposely balanced with the fill quantities.

Building the Base

As soon as the roadway excavation was completed to line and grade, the contractor began hauling in the 14,000 cubic yards of decomposed granite selected for the stabilized base, an adequate supply of which was available in a hill about a mile from the job. To get the material out, it was first drilled with Jackhammers operating with a 210-cfm Ingersoll-Rand compressor. Bits 1 1/4-inch in size were used on steel which seldom exceeded 10 feet in length. To get good breakage, about 3 pounds of 40 per cent powder was used for each 5 tons of granite shot down.

A 2 1/2-cubic yard Northwest shovel was used to load the broken granite into a fleet of 5-yard Ford, International and Chevrolet dump trucks. The selected base material was then hauled in over a

construction road kept smooth by a Caterpillar No. 12 diesel patrol, and dumped with the help of a truck spotter. About 1,500 cubic yards were handled in an 8-hour shift.

All of the select base was hauled in and completely processed before any cement was applied. As the selected material was dumped, it had to be broken down to meet a specified ultimate size. A sheepfoot roller, ballasted with water to approximately 2,200 pounds per linear foot of tread, was used to break up the chunks. In general, the mass was reduced so that no pieces larger than 2 inches were left, and this size was limited to about 3 per cent. Considerably more care was taken on the upper 6-inch layer of the subgrade, since that received the cement stabilization. The select course was therefore placed in two lifts, thoroughly working and compacting the first one before the second was applied. When the base material was sufficiently pulverized, blue tops were set, the last lift finished, and the surface trimmed to grade by the

Caterpillar patrol. When the subgrade was completely processed and ready for cement, about 85 per cent of it would pass a No. 4 screen, and perhaps 6 per cent would pass a 200-mesh sieve.

Subgrade Stabilization

The feature of the project was the

stabilization of the subgrade by the addition of some 8 per cent by weight of portland cement, and the mixing of the resultant mass in a Gardner oil-mixing machine. Careful laboratory control by Resident Engineer R. A. Bergman and his assistant, Wallace Ford, was com-

(Continued on next page)

SAFETY-IZE PUNCTURE SEAL COMPOUND

for
pneumatic
tires

—"a friend indeed" in this hour of need!"

Write
for
circular

Tires going—going—gone? Make ALL your tires last much longer by putting SAFETY-IZE in the tubes.

SAFETY-IZE, in your tires, will be ALWAYS ON THE JOB to plug and seal punctures, extending the life of the tires by guarding against under-inflation.

SAFETY-IZE MFG. CO., 2814 Fullerton Ave., Chicago

EASY BUCKET SPOTTING WITH KOEHRING

Boom Control



KOEHRING Boom Control is Accurate

Quick and easy clamshell or dragline bucket spotting saves seconds with every load. Accurate boom control... Koehring control... is reason why Koehring cranes have advantage of high speed loading or unloading... in batching plants... car unloading... handling concrete buckets... in industrial plants. Easy steering permits quick travel direct to operating location. No time lost "jockeying" for position. Boom operation and hoisting while swinging or traveling is another important second-saver. The many time-saving advantages of Koehring means speed on the job... more production per hour.



KOEHRING COMPANY • Milwaukee, Wisconsin
HEAVY-DUTY CONSTRUCTION EQUIPMENT



UNION PILE HAMMERS

Write for Bulletin

P. O. Box 18
Elizabeth, N. J.

UNION IRON WORKS, Inc.

Also Manufacturers of
PILE DRIVER LEADS
GROUT MIXER and EJECTOR
MINE AND SHAFT CAGES
SKIPS AND BUCKETS
AIR LOCKS
SUBAQUEOUS EQUIPMENT
TUNNEL SHIELDS
PILE DRIVER HOISTS

Method of Testing Moisture Content

(Continued from preceding page)

bined with systematic field methods to give gratifying results.

Bag cement was dumped by a labor crew at the rate of 135 sacks per road station. This was usually done before the machine operators arrived. The width of the highway was such that three passes of the Gardner machine were required to span the full width of the road.

As soon as the cement was spread, one trip was made over each of the three strips to mix the dry cement thoroughly into the dry soil. Following this operation, water for wet mixing was added in two trips, giving excellent moisture distribution.

The moisture content of the dry base was checked in advance by Mr. Ford, who determined from that the required number of gallons of water to be added to each strip. Instructions were then given to the Gardner mixer operator, who very successfully controlled the water being added, usually to within 0.3 per cent.

To maintain this accurate application, a sort of synchronized speedometer and water meter was used. An ordinary bicycle wheel was fastened alongside the Gardner machine and attached to a speedometer which indicated the rate of travel per minute and the total distance covered. This was similar to the hook-up generally used in oil application through the Gardner machine. Gallons of water per minute were indicated on an indicating dial near the speedometer, and the volume was governed by the operator through a valve stem extension within easy reach. After a short practice period, the two were so efficiently coordinated that exact applications of water were not unusual.

After the second wet-mixing trip was made, the moisture content was rapidly checked with a pycnometer by one of Mr. Bergman's men. The chief advantage of the pycnometer system is that it gives fairly accurate results in a fifth of the time it takes to heat a sample over a stove. The pycnometer is an ordinary looking jar, holding about one quart (although it may be any size), and covered with an inverted funnel which fits the cover threads of the jar. A reading of the free water content of the soil was made by following these steps:

1. Four pounds of the material to be sampled was carefully weighed and placed in the pycnometer.
2. The jar was then partly filled with water at room temperature.
3. The pycnometer was gently shaken and rolled to relieve any air bubbles clinging to the soil particles, taking care not to spill any of the contents.
4. The pycnometer was then filled completely to the top of the tin on the funnel, and the outside of the jar dried with a cloth.
5. The pycnometer and its contents was weighed.
6. Free water content of the soil sample was calculated from the following formula:

$$\text{Water Content} = \frac{100 (W - W_1) G_s}{S - G_s - 1}, \text{ where}$$

S equals the weight of the sample
W equals P plus S minus S_G

P equals weight of pycnometer filled with water
W₁ equals weight of pycnometer filled with soil sample and water
G_s equals the specific gravity of the saturated surface dry material

A chart was calculated and drawn up early in the job giving basic soil values

up to about 15 per cent of moisture. This reduced the sampling time to about four minutes. Pycnometer results were occasionally checked by baking out the moisture in a sample taken from the same location, and it was usually very close to the pycnometer reading.

At this stage of the work, the road surface consisted of three heavy rows of damp, dark material. These strips were spread immediately to the required thickness by the Caterpillar patrol, and shaped to the finished lines. Compaction was done by a Buffalo-Springfield 12-ton 3-axle roller making several trips over the surface. At the sides of the roadway the shoulders and water drains were rolled by a smaller smooth roller.

A seal coat of RC-2 road oil was applied by spray to the finished surface to insure that the stabilized subgrade would cure properly and develop its maximum compressive strength. An ordinary day's run was sprayed in an hour or so. By sealing the road with RC-2, a good bonding foundation was also assured for the hot black-top plant

mix which was placed on top of the cement-treated base.

About 890 cubic yards of decomposed granite was stabilized per 8-hour shift with the machines on the job. Utmost cooperation and mutual help between the contractor and the resident engineer made the job run along quietly and effi-

ciently.

Immediately following the selected subgrade stabilization came the application of the plant-mixed black top.

Plant-Mixed Black Top

The Oswald Brothers contract included.
(Concluded on page 32)

AMERICAN Safety-sized Pneumatic-tired **WHEELBARROWS**
IMMEDIATE SHIPMENT ON



Write for Bulletin

THE AMERICAN STEEL SCRAPER CO., SIDNEY, OHIO

American DeLuxe Concrete Wheelbarrows for War Orders

American No. 1—4 cu. ft. Struck Capacity DeLuxe Concrete Wheelbarrow.

Furnished with Steel Wheel or with the American Safety-sized Pneumatic Wheel.

Come with Steel Wheel...PERFECT-S

Come with Pneumatic Wheel...PERFECT

Come with Safety-sized Pneumatic Wheel...SAFETY

The March of TRUCK MIXER PROGRESS

1930



The old style hatch-loading type Smith Truck Mixer, an excellent machine in its day.

1934



One of the early Smith-Mobile high discharge models, successor to the old-style "hatch-loaders".

1938



Smith-Mobile improved, high discharge truck mixer — thoroughly tried and field tested.

1942



The new, compact, streamlined Smith-Mobile. Lighter in weight, yet permitting bigger pay loads. The "last word" in truck-mixer design.

● The evolution of the modern truck-mixer coincides with the history of the new Smith-Mobile. After producing old-style, hatch-loading type machines for several years, Smith Engineers saw the need for eliminating leaky and tiresome loading hatches, troublesome rear discharge doors, clogging water bells and inefficient low discharge. Many years of intensive research and field tests followed. Then came the announcement of the new Smith-Mobile — the industry's first HIGH DISCHARGE truck mixer. And with each succeeding model, important refinements were added.

Today, in its 5th year of quantity production, Smith-Mobile is the acknowledged leader in the industry. Sales have increased by leaps and bounds. Ready-mixed operators, contractors and engineers everywhere are acclaiming this new machine for its greater speed and efficiency. They like the HIGH DISCHARGE without hoist... the CONTROLLED DISCHARGE without segregation... the VISIBLE MIXING feature... the successful REAR END CHARGING... the new way of introducing water through the feed opening. No other truck mixer can give you these features. So play safe! Buy time-tested Smith-Mobiles. Write for new Catalog 198-B.

The T. L. SMITH COMPANY
2857 N. 32nd St. Milwaukee, Wis.

SMITH-MOBILE

The Original High-Discharge TRUCK MIXER & AGITATOR

COMPLETE WELL POINT SYSTEMS WILL DRY UP ANY EXCAVATION

Faster—More Economically

Write for Job Estimate and Literature

COMPLETE

MACHINERY & EQUIPMENT CO., Inc.

Dept. C

36-40 11th St., Long Island City, N.Y.

Tel. IRonsides 6-8600

Oil Transfer Method Saves Time and Oil

Novel Method Used In Garage Of District 2, North Dakota Highway Dept.; Equipment Repair and Storage

† WHEN inspecting the well-built attractive District Garage at Valley City, N. D., which houses the State Highway Department Division Offices as well as providing repair and storage facilities for highway equipment, we found a simple quick method of transferring lubricating oil from the original shipping drums to the Tokheim oil-dispensing tanks, which had been rigged up by one of the mechanics.

A 3/4-inch pipe about 1 foot longer than a short drum has a common oil-drum screw bung welded to it at the proper distance from the lower end so that the end of the pipe will just clear the bottom of the drum when the bung is screwed in. A short nipple is added when using this pipe in the deeper standard drums. An elbow at the top with a 1-foot nipple makes the delivery end when a short length of hose is slipped over it and into the receiving dispensing tank. Next a small bung from an oil drum has a metal air valve from a pneumatic tire brazed to it. This is put into the small bung opening, the pipe into the larger bung, the hose into the proper receiving tank for the grade of lubricating oil being transferred and then all that is needed is a little air applied intermittently from the garage compressor line to keep enough pressure in the drum to move the oil and not buckle the light metal head of the drum. This arrangement has proved to be very simple and effective.

The Building and Offices

The Division Garage and Offices at Valley City were built in 1934 and comprise a two-story light-brown brick structure at the front and one story behind for the garage section. On the second floor are the Division Engineer's offices, a clerical office and drafting room. The entire structure measures 50 x 140 feet in plan. The first floor is devoted entirely to repairs; storage is provided elsewhere in a special storage shed.

The Repair Garage

As one enters the large overhead door at the front of the garage, the parts department is found immediately at the left in charge of the shop clerk. A mezzanine over this wired-off section is used for the storage of tires and larger parts. At the right of the door is the gasoline dispensing pump and seven Tokheim lubricating-oil dispensing tanks.

Back of the parts room is a large rack for the temporary storage of tires which are being put to immediate use and then, running down the left side of the garage, are two metal-top benches which were made in the shop by welding. Beneath the stairs which lead to the second floor is a bubbler fountain, and adjacent to this the stairs leading to the basement and heating plant.



C. & E. M. Photo
A Cleaver tank-car heater is towed by the rear door of the Valley City District Garage of the North Dakota State Highway Department. This unit does added service in the spring in thawing frozen culverts.

On the first bench is a tube patching outfit, and stored carefully in bins beneath the bench are spare heads for engines, all repaired and ready to be put into immediate service. On the bench also is a black & Decker electric drill press, a wooden barrel containing battery water, a Tungar battery charger,

and the necessary vises for holding material on which work is being done.

Between the first and second benches is a well insulated telephone booth, a large tool chest belonging to one of the mechanics, a valve facer, a Manley garage compressor and a tool board, painted

(Concluded on page 47)



Today..MAINTENANCE IS THE WATCHWORD FOR AMERICA'S ROADS

WHILE America's first responsibility is to build more and more planes, ships and tanks to win the war, new road construction will necessarily be limited by military requirements... But not so maintenance!

Now and for the duration, "stitch-in-time" road work is more important than ever. It is soundly economical, vitally necessary... not only for strategic, cross-continent highways, but also for the equally important farm-to-market roads that are the backbone of our highway system.

For nearly 40 years Tarvia* has been helping highway engineers get the most out of available highway funds. This versatile paving material is being used with outstanding success to extend the life and service of all types of highways. It is annually saving taxpayers heavy replacement costs.

Why not discuss your road problems with the Tarvia field man? You'll find him ready with helpful advice and cooperation—based upon Barrett's unmatched paving experience. Phone, wire or write.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

Chicago • Birmingham • St. Louis • Detroit • Philadelphia • Boston • Providence • Rochester
Lebanon, Pa. • Minneapolis • Cleveland • Columbus • Youngstown • Toledo • Syracuse • Hartford
Norwood, N. Y. • Cincinnati • Buffalo • Bethlehem • Portland, Me.

In Canada: THE BARRETT COMPANY, LTD., Montreal • Toronto • Winnipeg • Vancouver
... ONE OF AMERICA'S GREAT BASIC BUSINESSES

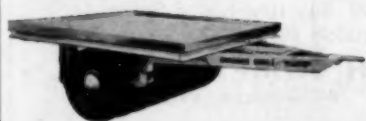


Only the most economical maintenance is necessary to make a Tarvia road last indefinitely—smooth, easy-riding, skid-safe. Send for your copy of the new Tarvia Manual.



*Reg. U. S. Pat. Off.

ROLL-TAMP



This most talked about rubber-tired roller on the market. The ROLL-TAMP offers the buyer more real value. It excels the field through its uniform rolling pressure—Fewer passes are required and gone are hard and soft spots in the compacted area—More effective and less costly because it saves time—Patented walking beam—Radial axle wheel mountings, adjustable height draw-bar and dual supporting stanchions make this Roll Tamp a most desirable piece of equipment.

Please write for descriptive bulletin MP-112B.

MADSEN
IRON WORKS
HUNTINGTON PARK, CALIFORNIA

Bin Level Indicator

Described in Catalog

The Bin-Dicator, made by the Bin-Dicator Co., 14,615 E. Jefferson Ave., Detroit, Mich., is a diaphragm-operated mercury switch for use on bulk materials, semi-liquids and liquids. It provides positive operation of signals and alarms, and makes possible automatic control of conveyors, elevators, feeders, weighing devices, and other machinery.

The Bin-Dicator operates simply, the pressure of the material forcing the diaphragm outward against the counter-weighted lever system, tipping the lever-plate and actuating the mercury switch. On bins and hoppers it can be used to indicate the level of the material and to control elevating and conveying

machinery automatically in response to fluctuating bin levels, and on elevator conveyors to indicate over-feeding and for emergency shut-off of machinery in case of over-feeding or choking.

A folder describing this unit and its applications may be obtained direct from the manufacturer by mentioning this item.

The Tie That Binds;

Company and Product

A new 32-page booklet distinctly American in character has been prepared by Richmond Screw Anchor Co., Inc., 836 Liberty Avenue, Brooklyn, N.Y., to tell the story of the development of prefabricated form-tying devices by this organization. This Rich-

mond Tyscru booklet illustrates the developments of the organization by pictures of its plant, the organized experience represented by its officers and workers, and photographs of a veritable "Who's Who" of jobs on which Tyscrus have been used.

The closing pages of the booklet are devoted to the district representatives of the company and a particularly pertinent comparison of concrete form ties which enable the designer to check his own ideas on whether a cheaper method can be devised and still be as effective. Copies of this booklet are available free on request to those mentioning this review.

*Do your share in the fight for freedom.
Buy U. S. War Bonds and Stamps.*

Bituminous Compounds

Waterproof Concrete

Inertol bituminous compounds for waterproofing and protecting concrete and steel structures of all types, such as bridges, piers, abutments, retaining walls, reservoirs, sewage treatment works, dams and penstocks, are described in a new bulletin issued by the Inertol Co., Inc., which has recently moved to greatly enlarged quarters at 470 Frelinghuysen Ave., Newark, N. J.

Copies of this bulletin, which describes the principal Inertol products and their uses and illustrates the various types of structures where they serve to waterproof and protect them, may be secured direct from the manufacturer by referring to this item.

WESTERN UNION

Gangway!

NEWCOMB CARLTON
CHAIRMAN OF THE BOARD

A. N. WILLIAMS
PRESIDENT

J. C. WILLE
FIRST VICE-PRESIDENT


Time of receipt is STANDARD TIME at point of origin. Time of delivery is STANDARD TIME at point of destination.

CLASS OF SERVICE
This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin.

AA350 TWS PAID 3=WF OKLAHOMACITY OKLA 5 534P
JOHN GRONLUND=HOTEL CHISCA MFS=
RETEL R-B FINEGRADER WORKING TEN HOURS A DAY SEVEN
DAYS A WEEK. IT OPERATES AHEAD OF ONE 34E SINGLE
AND ONE 34E DUAL DRUM PAVER PAVING 350 FEET PER HOUR=

here comes **AN R-B FINEGRADER!**



Picture it yourself —
one machine with one operator cutting grade fast enough to keep well ahead of both a single drum and a double drum 34-E paver putting down 350 feet of concrete per hour. That's really rolling and that's the reason so many of the nation's leading contractors use Buckeye R-B Power Finegraders. These machines cut the grade to the exact cross-section desired. They eliminate the costly and time-consuming work of grading and manpower to speed vital military roads and airports to completion ahead of schedule. They're virtually an essential on today's forced draft projects. Put an R-B Finegrader to work on your next road or airport job and you'll never try to get along without one again.

— The New York Times

BUCKEYE TRACTION DITCHER COMPANY, FINDLAY, OHIO

Built by Buckeye

Convertible Shovels



Trenchers



Tractor Equipment



R-B Finegraders



Road Wideners



Spreaders



Highway Operations In St. Louis County

(Continued from page 2)

tem, it is possible to check from year to year the cost of operation of each piece of equipment. In 1940, when the equipment rentals amounted to \$269,135, these rentals when compared to equipment charges missed checking by only \$447.00. While this is a very small margin of error, still some equipment rentals were considerably out of order, these errors plus and minus adjusting themselves in the grand total. It is expected through the new revised rentals that the total error will be no larger, and that the individual comparisons of equipment rental to equipment charges will be more nearly correct.

Equipment Used

When it is realized that St. Louis County is 60 miles wide and 132 miles from north to south, one understands that the decentralization of equipment is essential. This necessarily means a slightly larger amount of equipment, in proportion, than if the county were smaller and a single machine could be operated in several districts. The equipment in St. Louis County includes 36 trucks with all-wheel drive used for snow plowing, 51 light hauling trucks, 19 power graders, 72 pulled graders, and 99 snow plows, mostly of the V-type.

The equipment roster would be much larger if the county did more than maintenance and snow plowing. Practically all construction is done by contract, because of the availability of a large group of well-equipped contractors in Minnesota.

Engineering Department

The 1941 budget of St. Louis County carried an item of \$111,360 for the Engineering Department. There are forty-eight employees in this department, operating under the Assistant County Engineer, with two Division Engineers, one in the south and one in the northern part of the county. Three-man instrument crews are maintained in the Southern Division, with three assistant engineers in charge of special projects and a right-of-way engineer. An instrument crew is also maintained at Ely. At Virginia there is an assistant engineer and two 3-man crews, and the same at Hibbing. There are two secretaries and two draftsmen in the office in Duluth and, during the summer, additional inspectors are employed as required by the volume of work under way.

Construction Operations

During the summer of 1941, the county built 2 miles of 36-foot top gravel road to connect the airport with two main highways. The gravel was 12 inches thick, consisting of 9 inches of pit-run gravel on the bottom, with 3 inches of screened and crushed gravel with a maximum size of ¾-inch on the surface.

Considerable road-mix surfacing has been done, usually under contract, using 150 pounds of aggregate on a

primed base, giving a surface mat 1½ inches thick, and with a total thickness of 15 inches for the top and base.

The secondary county roads are given a bituminous treatment, after building up the grade and placing 9 inches of pit-run gravel under 3 inches of crushed gravel. The surface is shot with 0.33 gallon per square yard of SC-2 asphalt after blading the surface smooth, and it is allowed to set or cure for from three days to a week. The surface is then shot with 0.3 gallon per square yard of SC-5 or 6 and covered with from 18 to 20 pounds per square yard of screened sand, with a maximum of ¼-inch stone. This forms a smooth mat with non-skid qualities, and wears remarkably well under light traffic.

Maintenance Methods

The oil roads are treated every two years at a cost of about \$500.00 per mile. This builds up a mat and also serves to try out the subgrade. It therefore takes on the nature of stage con-

struction, and saves its cost in locating weak spots in the subgrade before any higher type of paving is placed.

Patching is done with tar and gravel mixed in a Rex mixer. The holes are carefully broomed out, brushed with tar, and then patched with the mixed material. A large-diameter steel-wheel roller is pulled over the patch by the maintenance truck to give uniform compaction. If the base is broken, it is carefully dug out and backfilled with a minimum of 4 inches of good gravel, before applying the patch.

Snow Plowing

When asked about the methods of snow plowing in St. Louis County, George W. Deibler, County Engineer, reported concisely, "When it snows, it blows, so we wait until the storm subsides." There is no need of providing additional traps for snow by plowing out long areas of road while there is still a very strong wind and snow is falling. St. Louis County plows its roads out as wide as possible, using

the heavier equipment to push back high windrows at the side, and wings to move the snow out still further, beyond the shoulders. This county is one of the few which plows private drives, being reimbursed for this work by the owners.

The Fifth District Garage

The Fifth District Garage at Pike

(Concluded on page 38)

THOMPSON CONSTRUCTION MATERIALS & EQUIPMENT

CONCRETE CURING MATERIALS
• Hunt Process
• Ritacure
• Cotton and Fibre Mats
• Salt Hay
• Paper
EXPANSION JOINTS
• Bituminous-Fibre
• Asphalt
• Cork
• Wood
• Rubber Latex
Write for complete literature and prices
THOMPSON MATERIALS CORP.
Sales Office: 204 West St., N. Y. General Office: 303 Cortlandt St., Belleville, N. J.



TOUGH AS A FIGHTING COCK



handles like a baby chick...

Two of the main requirements in wire rope—rugged toughness, and smooth, easy handling—get together in Bethlehem Purple Strand Form-Set.

The Purple Strand in the rope means that the wires are made of 100 per cent Improved Plow Steel—the strongest, guttiest steel used in commercial rope.

Form-Set means that these super-tough steel wires are pre-formed, making the rope relaxed, easy to handle. Form-Set Purple Strand can be cut or spliced without seizing, stands up better under bending fatigue.

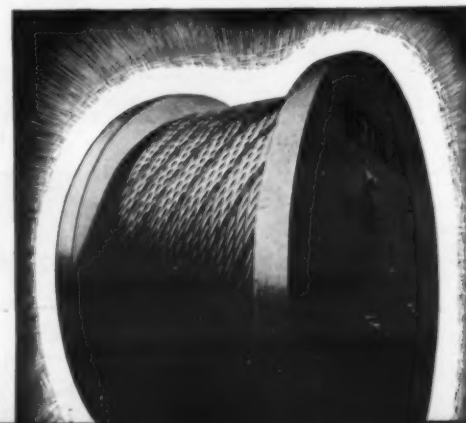
And don't forget...

Behind Bethlehem wire rope are 54 years of building, designing, testing and proving wire ropes of all sizes and types. This means a backlog of skills that can't be copied and that has no substitute. Bethlehem Wire Rope represents the combination of selected, quality steels, soundly-engineered designs, and mature craftsmanship. That's something to remember at a time when it's more important than ever to use the most efficient tools in every construction or production job.



BETHLEHEM STEEL COMPANY

**PURPLE STRAND
FORM-SET
WIRE ROPE**



HEET-MASTER—SAVES 50%

ON FUEL

HEATS TAR
& ASPHALT
TWICE
AS FAST



Send for
Bulletin No. 196
HEET-MASTER Kettles for
AEROIL BURNER CO., INC.
3775 Park Avenue, West New York, N. J.
Chicago San Francisco Dallas



Badly damaged wood piles saved by Dens-Hard jackets.

Damaged Wood Piles Concrete Jacketed

The destruction of wood piling under marine structures and bridges by marine borers, fire, decay and warfare is a serious menace to our wartime economy. In the past, piles have often been replaced when only 5 per cent of the pile had been eaten away in the tidal area by marine borers, thereby discarding practically 95 per cent of the pile unnecessarily. At the present time this is an even more uneconomical procedure.

Concrete jacketing of damaged piling is not new as a protection but improvements have been effected in putting sound reinforced concrete around piles which have large holes and irregularities below the water line. The Dens-Hard reinforced-concrete jacket of the Pile Protection Co., P.O. Box 634, Journal Square Station, Jersey City, N. J., casts a waterproof surface as an integral part of the entire concrete jacket which is 2 to 3 inches thick over the reinforcing. The concrete is specially designed to resist the disintegrating forces of ice and magnesium sulphate in sea water and is poured without coming in contact with salt water, regardless of the condition or length of the pile.

In protecting a pile by this method, the pile is first cleaned of all marine growth by metal scrapers, and the proper amount of reinforcing fitted to the pile. After the metal form is set in place the water is removed and the inside of the form and the reinforcing coated with a special cement grouting. Immediately thereafter concrete is poured through the side of the form from the bottom up, resulting in a reinforced-concrete jacket which the manufacturer states has a dense waterproof surface covering the entire jacket.

Details of the method and cost may be secured direct from Pile Protection Co. by referring to this descriptive text.

Asphalt Contractors' Promotional Bulletin

Five or six years ago The Asphalt Institute prepared a folder at the request of contractors engaged in producing and placing asphalt mixtures on private driveways, parking lots, filling station areas, tennis courts, sidewalks and for industrial parking areas. These folders were made available to contractors in relatively small lots of 500 copies or more.

Such was the demand for these fold-

ers that a new pamphlet has been prepared with a striking front cover bearing the title "Smooth and Lasting Asphalt Surfaces Are Inexpensive". There is ample space for the imprint of the contractor's name and address on the front and the folders are available at an unusually low price direct from the Institute.

Copies of the folder, further information and prices may be secured direct from The Asphalt Institute, 801 Second Avenue, New York City.

New Marion Export Mgr.

Announcement has been made by the Marion Steam Shovel Co., Marion, Ohio, of the appointment of J. A. Riley, District Manager of its New York office, as Export Manager. Mr. Riley, who will retain his position as District Manager, will make his headquarters at the Graybar Building, 420 Lexington Ave., New York City, where Marion's District Office has moved from its former location in the Chrysler Building.



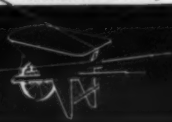
NEARLY 40 YEARS AGO
Sterling STOPPED BUYERS
FROM ORDERING "Just
another load of wheelbarrows"

STERLING engineers began (back in 1904) to answer "What's the difference in wheelbarrows?" Many soundly engineered advantages, plus "Easy Wheeling" and perfect balance, proved to buyers that here was *more for their money*. Sterling has stuck to producing *engineered* quality wheelbarrows, and buyers have stuck to Sterling, for nearly 40 years.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

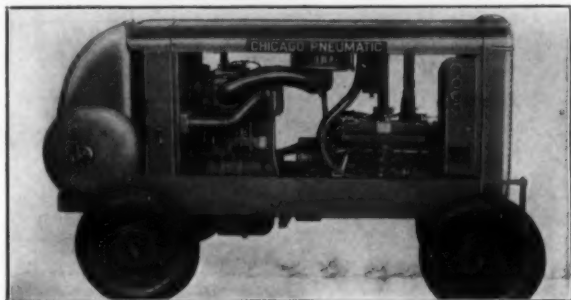
Sterling
WHEELBARROWS

Look for this Mark of
STERLING Quality

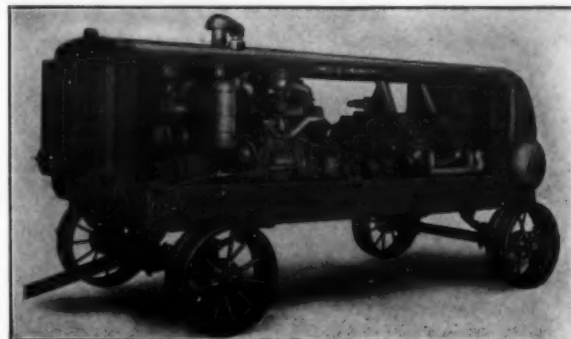


★ ★ ★ ★ CHICAGO PNEUMATIC NEWS ★ ★ ★ ★

15% TO 35% MORE AIR PER GALLON OF FUEL



↑ 15% MORE AIR PER GALLON OF FUEL on full-load performance... up to 35% more air on partial loads. Improved combustion chamber, manifold, water circulating system and carburetion — plus CP Gradual Speed Regulator give new economy in gasoline-driven portables.



↑ 500 CUBIC FEET OF AIR ON WHEELS... this CP Diesel-driven portable has the Gradual Speed Regulator and all the economy of the smaller portables. Automotive steering — standard on 210 to 500 c.f.m. portables, provides safer towing and quicker turning in shorter radius.



↑ NEW ECONOMY IN A TRAILER COMPRESSOR — these new CP Streamlined Portable Compressors are available in a variety of mountings... gasoline-driven models in 105, 160, 210 and 315 c.f.m.; Diesel-driven in 105, 160, 210, 315, 365 and 500 c.f.m.; actual capacities.

GRADUAL SPEED REGULATOR FEATURES NEW CP PORTABLES

Increases Efficiency, Cuts Maintenance

NEW YORK (CP) — A new line of portable air compressors, featuring for the first time the Gradual Speed Regulator and other improvements which result in a fuel saving of 15% to 35%, has just been announced by the Chicago Pneumatic Tool Company. Automatic in action, the unique Speed Regulator synchronizes engine speed with air demand, speeding up or slowing down the engine as required. Speed is varied gradually, smoothly — effecting a marked reduction in fuel consumption and wear.

An illustrated booklet describing all the new features of these highly efficient, fuel saving compressors is now off the press. Write CP for your copy today.

CHICAGO PNEUMATIC
TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.



↑ GRADUAL SPEED REGULATOR automatically, gradually — not by steps. — synchronizes engine speed to rise and fall of air demand. Engine operates at most efficient speed at all times — no sudden acceleration or deceleration to cause fuel losses and engine wear and tear.

Carey
Elastite

EXPANSION
JOINT

Standard in Concrete Construction for 26 Years
ECONOMICAL and EFFICIENT

Asphalt Joint • Rubber Joint
Non-Extruding Expansion Joint
Plate Dowel Expansion Joint
Sub-grade Felt

THE PHILIP CAREY MFG. CO.
Dependable Products Since 1873
LOCKLAND, CINCINNATI, OHIO

CHICAGO



PNEUMATIC

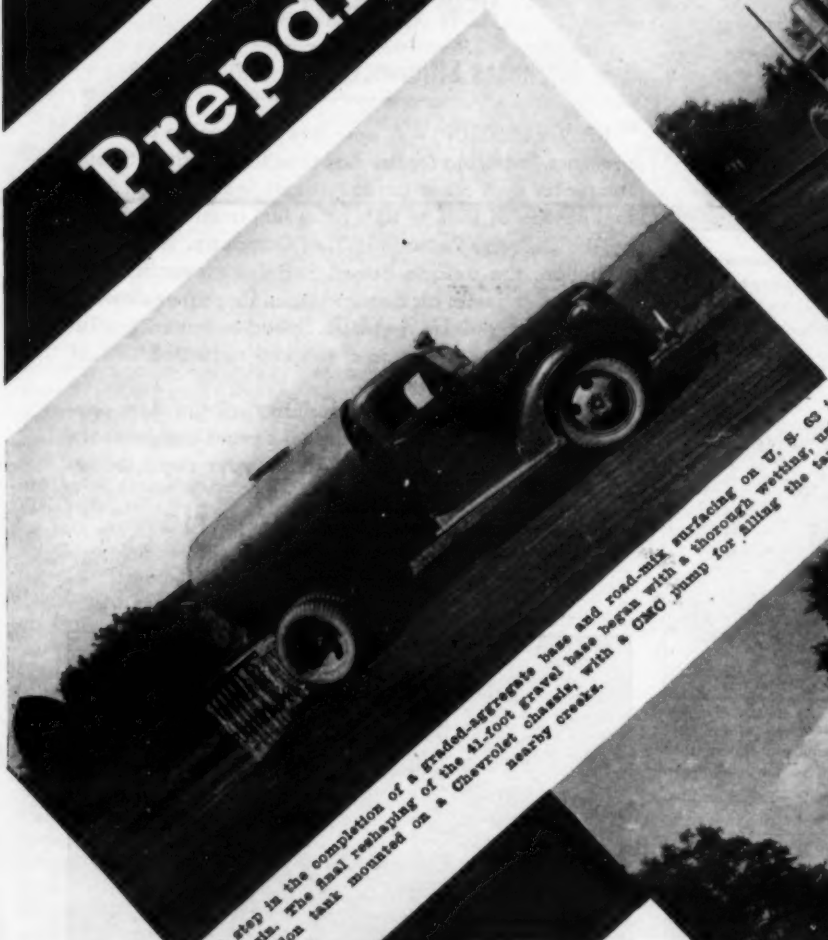
AIR COMPRESSORS

ALSO: Pneumatic Tools, Electric Tools, Rock Drills,
Hydraulic Aviation Accessories, Diesel Engines

PORTABLE
STATIONARY
AIR OR GAS
MOTOR DRIVEN
STEAM DRIVEN
DIESEL ENGINE
DRIVEN

Road Mix In Wisconsin

Preparation of the Road Base

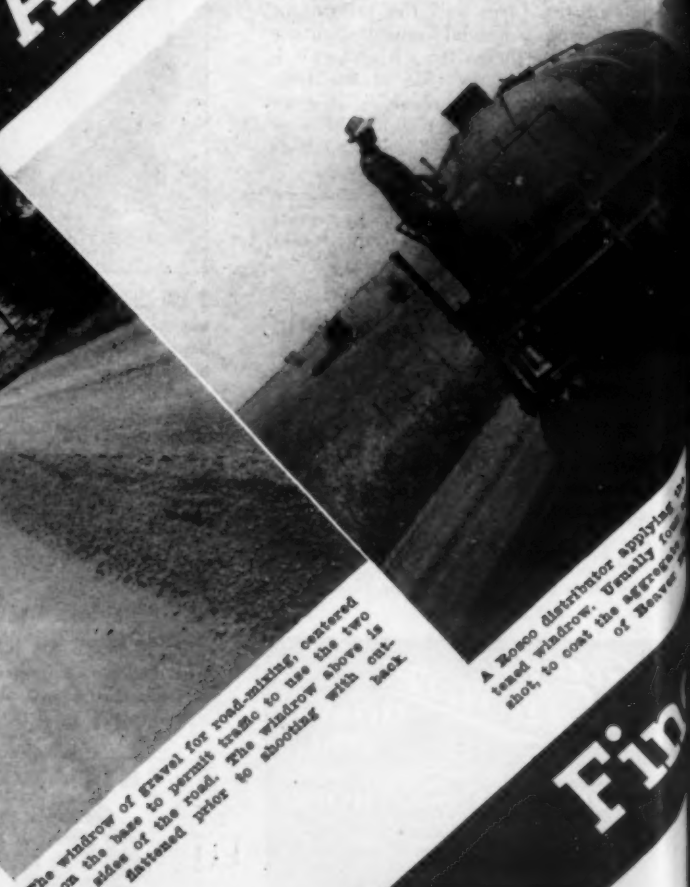


First step in the completion of a graded-aggregate base and road-mix surfacing on U. S. 63 in Wisconsin. The final reshaping of the 41-foot gravel base began with a thorough wetting using a 700-gallon tank mounted on a Chevrolet chassis, with a CMC jump for filling the tank at nearby creeks.



The second of this series of photographs taken by the Editor of CON-TRACTORS AND ENGINEERS MONTHLY shows a Caterpillar No. 12 roller loaded to 8 tons and pulled by a farm tractor, blading across the base. This was immediately rolled by a wobble-wheel

Applying Asphaltic



The windrow of gravel for road-mixing, centered on the base to permit traffic to use the two sides of the road. The windrow above is flattened prior to shooting with cut-back.

A Bomo distributor applying asphaltic material to the road base. Usually the material is shot, to coat the aggregate.

Fin



The Bomo wobble-wheel roller and A.C. farm tractor then allowed to dry, swept, and 400 cubic yards was then windrowed to one side, the surface was then windrowed to a width of 26 feet and then

Oil and Mixing

surface which was placed down the center. This application of MC-1 per square yard of road mix for 24 hours.

on the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

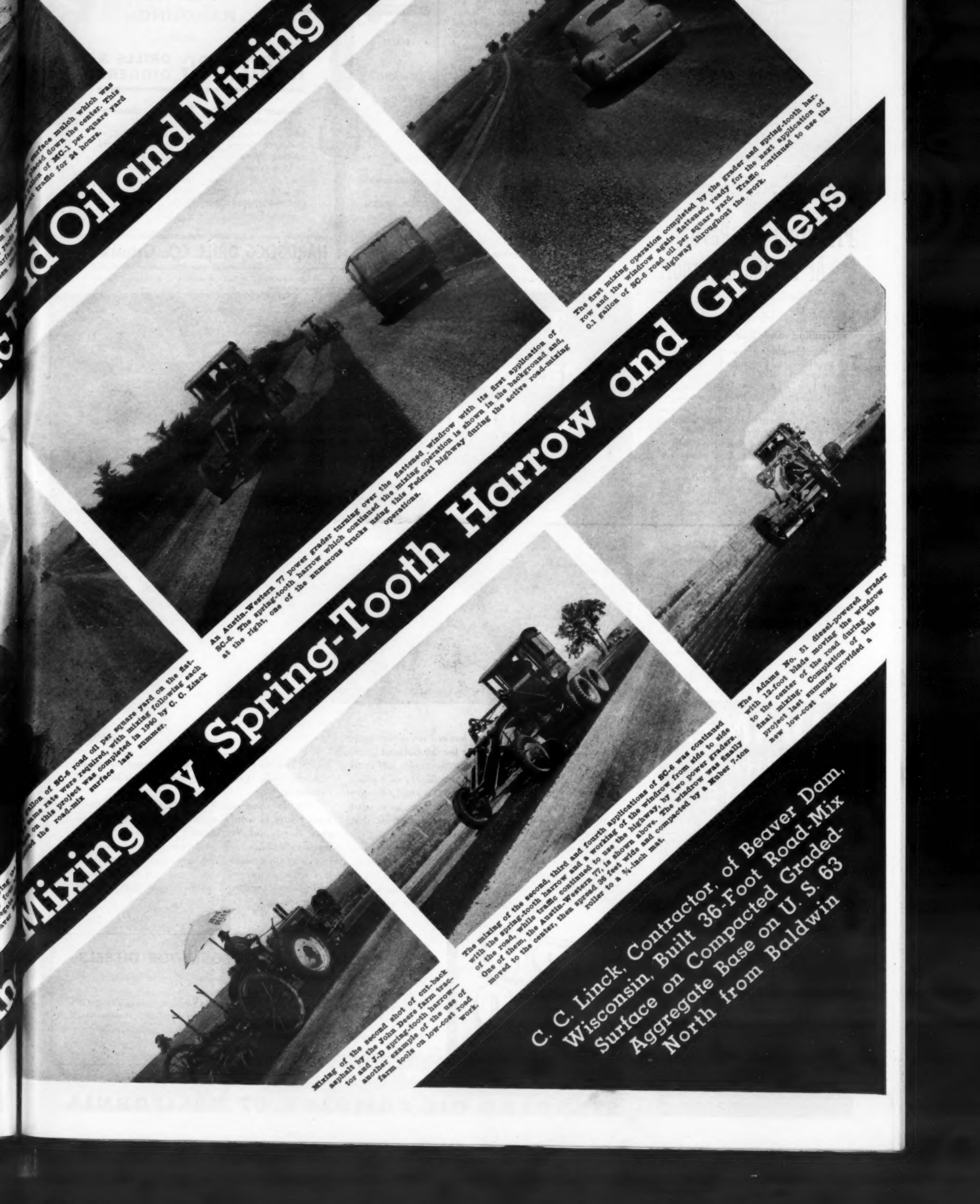
the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been

the
Tide
surface
has been



Mixing by Spring-Tooth Harrow and Graders

The first mixing operation completed by the grader and spring-tooth harrow and the windrow area flattened, ready for the next application of 0.1 gallon of SC-6 road oil per square yard. Traffic continued to use the highway throughout the work.

An Austin-Wester 77 power harrow turning over the flattened windrow with its first application of SC-6. The spring-tooth harrow which contained the mixing operation is shown in the background and at the right, one of the numerous trucks using this Federal highway during the active road-mixing operations.

Application of SC-6 road oil per square yard on the surface. The same rate were required, with mixing following each application of the road-mix surface last summer.

The mixing of the second, third and fourth applications of SC-6 was continued with the spring-tooth harrow and a working of the windrow from side to side of the road, while traffic continued to use the highway by two power graders. One of them, the Austin-Wester 77, is shown above. The windrow was finally moved to the center, then spread 36 feet wide and compacted by a Miller 7-ton roller to a 1/4-inch mat.

The Adams No. 51 diesel-powered grader with 12-foot blade moving the windrow to the center of the road during the final mixing. Completion of this project last summer provided a new low-cost road.

Mixing of the second shot of cut-back asphalt by the John Deere farm tractor and J-D spring-tooth harrow—another example of the use of farm tools on low-cost road work.

C. C. Linck, Contractor, of Beaver Dam, Wisconsin, Built 36-Foot Road-Mix Surface on Compacted Graded-Aggregate Base on U. S. 63 North from Baldwin



C. & E. M. Photo
A Kohler 1,500-watt lighting plant with 20-foot tower and a small compressor for night work and for pumping up tires.

Preparing for Paving At Southern Airport

(Continued from page 2)

hour shift.

Grading and Runway Base

A considerable amount of shallow cut required on the runway shoulders was handled with a Caterpillar D8 tractor and LeTourneau Carryall scraper. Adjacent to the 150-foot runways, which have a 1 per cent grade from the center line in both directions, forming the crown, selected material from the field was placed as a shoulder which is continued on a 1 per cent grade for drainage for a maximum distance of 200 feet, and then with a backslope of 1½ per cent grade, forming drainage depressions in the triangles between runways. The runway shoulders were finished by a D8 tractor pulling a 10-foot Adams grader.

For the small necessary amount of night work carried on under the grading contract by W. R. Aldrich & Co. of Baton Rouge, La., a Kohler 1,500-watt electric plant mounted on a platform on skids was used to furnish current for two 500-watt reflector lights mounted at the top of a 20-foot steel tower carried on the same base. On the base was also mounted a small garage compressor and air tank with electric drive from the Kohler plant to

furnish air for inflating truck and scraper tires.

Material for the 150-foot runway base was hauled from a long borrow pit outside the nearby Mississippi River levee, with a 2-mile haul. This pervious river sand was loaded by a Northwest 1-yard dragline powered with a General Motors diesel engine and equipped with a 40-foot boom. A fleet of twelve trucks was used to haul the material and spot-dump it on the runway area for inspection, drying and the approval of the Resident Engineer. Upon approval, it was spread by an International TD-14 tractor, equipped with a Bucyrus-Erie bulldozer, in 6-inch lifts to a maximum depth of 1 to 2 feet, depending on the contour of the ground, and compacted by sheepfoot rollers. The material packed very well, with the rollers walking up out of the material quite quickly.

Drainage

The four runways, varying from
(Concluded on next page)

IF YOU WANT POWER, DURABILITY AND EASE OF HANDLING—

use

HARDSOCC DRILLS & DIGGERS

WRITE
FOR
SPECIFICATIONS
AND
PRICES

Manufacturers
of
ROCK DRILLS
since
1904

Light-duty
Demolition Tool
for breaking up
concrete floors or
tearing down brick
or concrete walls.
You can drill holes
to a depth of four
feet with this model.

Lowest
air-consumer
of any Clay Digger
of its weight and
size on the market.
Gets amazing
results in hard clay,
hard pan, frost or
shale.

HARDSOCC DRILL CO., Ottumwa, Iowa

This wrench has been idle for 11,000 hours



Gus Zimmerman's wrench has not always led such an easy life. As chief engineer for the Galland Laundry in San Francisco, Mr. Zimmerman's job is to take care of all the intricate machinery in a plant that uses 118,252,000 gallons of water and 1,665,000 gallons of soap per year. A very important part of that machinery is a big Diesel-generator set that handles the juice for the night shift.

For some reason that nobody could figure out, that engine kept Mr. Zimmerman's wrench busy. For the first two years of its life it only averaged 2700 hours between overhauls. Rings stuck, cylinder wear was high, gum and carbon stuck the

valves, and the din it made carried across the street.

At this point it is probably better to let Mr. Z. do the talking:

"Yes, we tried out RPM DELO, and frankly I wasn't sure it would make a great deal of difference. But it did. We haven't had a stuck ring or stuck valve—and the engine is so quiet now you can carry on a normal conversation right beside it. But what counts most is it has run 11,000 hours without my putting a wrench to it and it is still going strong."



ORDER RPM DELO FOR YOUR DIESELS

RPM DELO is marketed under the following names:

RPM DELO

Calso Diesel Engine Lubricating Oil • Sohio RPM DELO • Caltex RPM DELO
Kysco RPM DELO • Signal RPM DELO • Imperial-RPM DELO (concentrate)

Ask your Diesel engine manufacturer or distributor for the
RPM DELO supplier in your vicinity.

CUMMER ASPHALT PLANTS

Portable Combination Hot
and Cold Mix Plants

Portable Hot Mix Plants

Stationary Combination
Hot and Cold Mix Plants

Cummer Combination
Dryer-Coolers.

Steam Jacketed Mixers 400
to 8000 pounds capacity.

Cummer Internal Fire Dryers

Electric Batch Timers

THE F.D. CUMMER & SON CO.

Euclid and 17th, Cleveland, Ohio

STANDARD OIL COMPANY OF CALIFORNIA

Laying Drainage Pipe At Airport in South

(Continued from preceding page)

4,000 to 5,000 feet in length and all 150 feet wide, cross in such a manner as to require triangular drainage depressions which are connected with storm sewer outlets through catch basins and concrete pipe sewers. Eight-inch perforated corrugated asphalt-coated drainage pipe is laid 25 feet in from the edge and under all runways from 2 to 3 feet below the natural ground elevation. This pipe has 6 inches of washed gravel below it, and 4 inches on either side in an 18-inch trench which is filled to the top with sand and gravel. A Buckeye ditcher was used for excavating the trench for all of the 8-inch drain pipe.

The deeper excavation in some of the drainage depressions was done with a P & H dragline with a 40-foot boom and 1-yard perforated bucket loading to four light trucks. A Northwest dragline with a 50-foot boom and a 1 1/4-yard lattice bucket excavated the drainage ditch for the 30 to 54-inch concrete pipe, and also laid the pipe, while a smaller dragline excavated the ditch and laid the 15 to 24-inch pipe.

The gravel base for all of the concrete pipe is one-quarter the outside diameter of the pipe in thickness and one and one-quarter times the outside diameter for the width of the gravel in the trench. Gravel was also used under catch-basin and manhole bottoms as a construction expedient, because of the unstable character of the soil. All back-fill around the concrete pipe was placed in 6-inch layers and hand-tamped, using the material excavated from the top of the trench because it was drier than the bottom excavation. A Domestic diaphragm pump driven by a Lauson engine and a Barnes pump with a Stover engine were used for draining the pipe trench during the paving of the manhole foundations and during the laying of the brick sides and concrete cap.

For placing the gravel in trenches where the ditch was wide because the material was wet and sloughed off, the contractor used 1-yard bottom-dump buckets set at the side of the trench, into which the gravel trucks dumped their loads direct. The buckets were then hoisted and let down into the ditch when the bottom latch was tripped. When the edge of the ditch was reasonably dry, the trucks tail-dumped directly into the ditch over the storm sewers.

A wide drainage ditch rings the entire field to collect all of the water from the various drains and storm sew-

ers. The water is finally disposed of by an existing drainage pump nearby.

Quantities

The major quantities on which the contractor's bid was made were as follows:

Rolled fill of pervious material	110,000 cu. yds.
Excavation and grading	125,000 cu. yds.
Corrugated perforated asphalt-coated sub-drains, 8-inch	32,000 ft.
Concrete storm sewer, 8-inch	1,300 ft.
Concrete storm sewer, 24-in. h	2,300 ft.
Concrete storm sewer, 30-inch	610 ft.
Concrete storm sewer, 36-inch	1,310 ft.
Concrete storm sewer, 42-inch	500 ft.
Concrete storm sewer, 48-inch	430 ft.
Concrete storm sewer, 54-inch	1,100 ft.
Catch basins and manholes combined	7
Catch basins	9

Personnel

The general contract for clearing, grubbing, grading and drainage for this new airport of the City of New Orleans, La., was awarded to W. R. Aldrich & Co., of Baton Rouge, La., for which O. G. Kirby was Superintendent. The clearing and grubbing was done by the Norman Construction Co., of Lake Charles, La. The contract was awarded by the Civil Aeronautics Au-

thority, and the work was supervised by the New Orleans District, U. S. Engineer Department, with Carl Scherer as Resident Engineer.

*Your dollars will help lick the Axis.
Buy U. S. War Bonds and Stamps and
free the world of tyranny!*

Executive Vice President

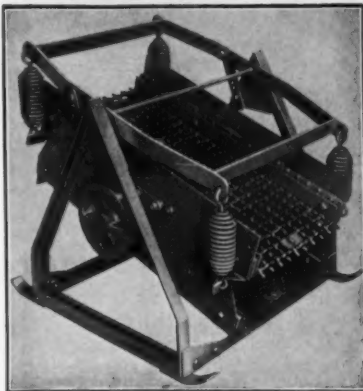
H. B. Higgins, a Director of Pittsburgh Plate Glass Co., Pittsburgh, Pa., and a Vice President since 1928, has been elected Executive Vice President of the company. He heads the Company's merchandising division.

3 Sizes, 100 Tons Per Day!

Yes, that's the capacity of this Portable Vibrating Screen, and it requires the power of only a 2 hp. gas engine or 1 hp. electric motor. Easily moved. For road and construction work, concrete block making, quarries, factories, etc.

Write for Bulletin No. 110

ROBINS CONVEYING BELT CO.
PASSAIC NEW JERSEY



STRENGTH

—possible only with welded construction



WELDED DIPPERS



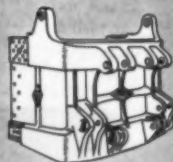
The one piece manganese steel renewable front.



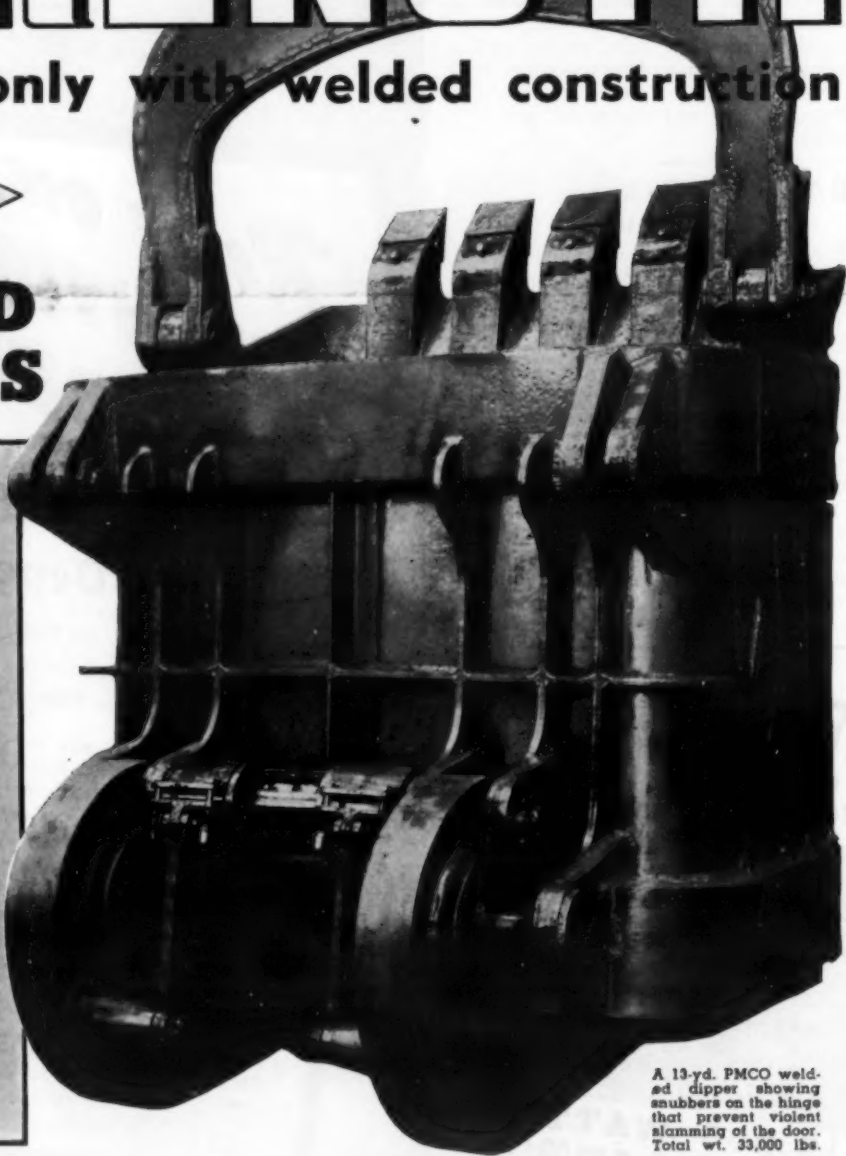
Alloy steel box sectioned upper and lower hood pieces.



Alloy abrasion resisting body plate.



Reinforcing sections at points of stress give that extra strength to the body.



A 13-yd. PMCO welded dipper showing snubbers on the hinge that prevent violent slamming of the door. Total wt. 33,000 lbs.

These sections of manganese steel and steel alloys are welded together to provide unusual strength—strength proven by the records of many PMCO Welded Dippers in use today. Through

years of experience in building large size welded dippers, our engineers have made the outstanding feature of the modern PMCO Welded Dipper its STRENGTH.

We operate the largest and most complete manganese steel foundry in the United States.

PETTIBONE MULLIKEN CORPORATION

Established 1880

4710 West Division Street, Chicago, Illinois

PILE HAMMERS and EXTRACTORS HOISTS-DERRICKS WHIRLERS

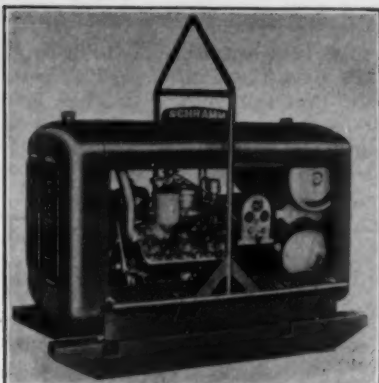
Special Equipment
Movable Bridge Machinery

Write for descriptive catalogs.

McKIERNAN-TERRY CORP.

19 Park Row, New York

Distributors in Principal Cities



The Model 60 Schramm air compressor

New Air Compressor, Compact and Handy

A small semi-portable air compressor with special skids and lifting bale, recently announced by Schramm, Inc., West Chester, Pa., includes shackle bolt fittings attached to the frame, and removable wood skids for mounting on a chassis, trailer, truck, or a base. It delivers 60 cubic feet of air per minute at 100-pounds gage pressure. The lifting bale makes it possible to put the compressor in many tight spots where a short air line means greater tool efficiency.

This Model 60 Schramm compressor is powered with a Mercury V-8 engine, four cylinders being used for power and four cylinders for compressing air, thus eliminating all belts, chains and gears or other forms of transmission. It is a self-contained unit with electric self-starting, air and fuel tanks, and a cooling unit.

All You Want to Know On How to Get Tires

The manufacturers of automobile and motor-truck tires have unanimously co-operated with the Government to assure to users the longest service and widest distribution of tires possible during the rubber famine. The Goodyear Tire & Rubber Co., Inc., Akron, Ohio, has now prepared a loose-leaf booklet which gives the entire story on the availability of tires, who may secure them and how.

Specifically, the features of the booklet are: 1. Procedure for obtaining new truck tires under tire-rationing regulations; 2. Eligibility classification for new tires; 3. Procedure for obtaining recapped or retreaded truck tires under

tire-rationing regulations; 4. Eligibility classification for recapped and retreaded tires; 5. Timely tips; 6. Recommendations for improving tire life expectancy; 7. Explanation and illustrations of types of capping and retreading; 8. Tire inspection forms for use in checking tires on vehicles; 9. Summary of tire inspection data to determine the number of new tires and recaps for which certificates should be obtained from a local Rationing Board.

Copies of this booklet are available to truck owners and operators without cost direct from Goodyear.

Assistant Sales Manager

Charles P. Gilkison, former factory representative at Minneapolis, Minn., for the American-Marietta Co. of Chicago, Ill., has been named assistant to Roland G. Maus, Sales Manager. Mr. Gilkison, who joined this firm four years ago, will make his headquarters at the company's main office, 43 E. Ohio Street, Chicago, Ill.

Convertible Cranes For Faster Service

To meet a wide range of job requirements and conditions, the Bucyrus-Erie Co., South Milwaukee, Wis., has announced the 15-B and 22-B transit cranes of 10 and 20-ton rating. The smaller of these units, the 15-B, is convertible to a 1/2-yard excavator as previously described in these columns. The second unit, the 22-B, which has a maximum crane rating of 20 tons, is convertible to a 3/4-yard clamshell, dragline, shovel or dragshovel.

A 10-wheel mounting, designed exclusively for crane excavator service, provides traveling speeds up to 27.5 mph for the 15-B and 31 mph for the 22-B. The cranes are equipped with full-vision mounting cabs, the smaller unit has vacuum booster-set air brakes on all four rear wheels, and the larger carries Westinghouse internal air brakes on the rear wheels.

These new cranes are described in detail in Bulletin TC-1, copies of which

may be obtained without charge by writing to CONTRACTORS AND ENGINEERS MONTHLY or directly to Bucyrus-Erie Co., South Milwaukee, Wis.

"FLEX-PLANE"

Finishing Machines
and
Joint Installing
Machines

FLEXIBLE ROAD JOINT
MACHINE CO.

Warren, Ohio



Above, Left: Building a New Approach Road for a Mining Co. near Aspen, Colorado. Model HT-60 Heil Trailbuilder and Model D Cletrac.

Above: Digging Drainage Ditches near Latimer, Pennsylvania. Model HT-60 Heil Trailbuilder and Model D Cletrac.

**Rely on
HEIL HYDRAULIC
TRAILBUILDERS
AND BULLDOZERS**
for Fast,
Dependable Work

Immediate Delivery on Heil Trailbuilders and Bulldozers for All Cletrac Tractor Models!

Tractors equipped with Heil Trailbuilders and Bulldozers are flexible, all-purpose earthmoving units that give you increased production and lower costs on a wide variety of dirtmoving and construction jobs. Powerful, hydraulically-controlled Trailbuilders and Bulldozers provide faster, more efficient operation in clearing land—or digging, filling, spreading, or leveling any kind of material.

Hydraulic pressure holds the blade down into the cut and insures clean-

cut, positive digging action . . . Large diameter hydraulic cylinders permit the use of low hydraulic operating pressures . . . Correct balance and weight distribution give full power on the tracks in any blade position . . . Sturdy, box-section construction provides maximum strength for tough digging conditions.

An investment in a Heil Trailbuilder or Bulldozer for your present tractor equipment will increase its value, utility and efficiency. Act now, while you can still get immediate stock delivery of Heil Bulldozers and Trailbuilders for any Cletrac Tractor. See your nearest Heil distributor—or phone, write or wire us, today.

Above: Pushing Bar Stock into Steel Furnace at Cleveland, Ohio Plant. Special Model HB-25 Heil Bulldozer and Model D Cletrac.

Below: At the Columbus, Ohio Garbage Disposal Plant. Model HT-60 Heil Trailbuilder and Model D Cletrac.



RED DEVIL
LIGHT
and POWER PLANTS
800 to 50,000 WATTS



3,000 WATT
as
illustrated **\$445⁰⁰**
on
Pneumatic Tires

Finish the job quicker and save money with electricity.

Send for catalog describing generators and our complete line of portable poles for floodlighting.

E. B. KELLEY CO., Inc.
43-47 Vernon Blvd.
Long Island City, N. Y.



Heil Hi-Speed Tractor-Scoop. 150 H.P. Rubber-Tired Heil Diesel Tractor with 15-Yd. Capacity Heil Cable-Operated Scoop.



Pushloading a 15-Yd. Capacity Heil Twin-Cable Scoop at an Airport in Alabama. Model HB-25 Heil Bulldozer and Model D Cletrac.

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE, WISCONSIN



C. & E. M. Photo
"Ham" Baker, Superintendent for the Allied Contracting Co., at left, and F. E. Burrill, Resident Engineer for the Wisconsin State Highway Commission.

Constructing Piers For Chippewa Bridge

(Continued from page 11)

wide and 7 feet deep.

The forms for the abutment were not lined, as the abutment is of open construction and therefore will be practically surrounded by the approach fill. The forms consisted of 1 x 6-inch face lumber, with 2 x 6-inch studs spaced 16 inches on center, and 2 x 6-inch double wales spaced 30 inches on center. Williams form clamps with 1/2-inch tie rods were used, spaced uniformly about 30 inches apart horizontally and vertically. Two 24-inch I-beams were used as falsework to support the tie beam between the two columns, and the I-beams were carried on five timber bents.

While the footings were poured from ground level direct from the truck mixers, it was necessary to elevate the concrete for pouring the columns. The truck mixers delivered the concrete to a bottom-dump bucket, which was raised by a Northwest crane with a 45-foot boom and dumped into hoppers with elephant-trunk chutes at the top of the piers. The concrete was vibrated with two Jackson electric vibrators, operated by a Wisconsin engine and generator.

First Two River Piers

For the construction of the first two river piers, the smaller Northwest crane was walked out into the river, building a dike around Pier 7; and then the larger Northwest continued out and built the dike for Pier 6 farther into the river. Bethlehem 16-inch web DP1 sheet piling was driven with swinging leads and a follower by a drop hammer to form the cofferdams for each pier. As this operation was carried on well out into the river where coarse gravel predominated, no wellpoints were used. On the first pier, No. 7, three blows occurred under the sheet piling, but these all stopped without any difficulty when the foundation piles were being driven.

To form the foundation for both Pier 7 and Pier 6, 80 untreated wood piles were driven by a Vulcan No. 2 steam hammer, swung by the larger Northwest crane. Steam was furnished by the 20-hp boiler of an old Minneapolis threshing machine on shore, with the steam line carried along the dike and covered with gravel to protect the men from burns

from the pipe.

The footings for Piers 7 and 6 are 10 feet wide, 50 feet long, and 4 feet 6 inches thick. To keep the water down in the cofferdam during pouring, a 6-inch Jaeger Sure-Prime pump and a 4-inch Gorman-Rupp pump were used in the cofferdam for Pier 7, and two 6-inch Jaeger Sure-Prime pumps on Pier 6. All of the wood piles were shod with welded steel points, making the driving much more accurate and causing less damage to the pile than driving with a bare tip.

The abutment required 162 cubic yards of concrete above the footing, the footing of Pier No. 7 required 82 cubic yards, and the same for the footing of Pier 6. A total of 144 cubic yards of concrete was required for the columns above the footing in Pier 7, and 159 cubic yards for Pier 6. The operations on this abutment and these two piers are typical of the operations throughout the work across the river. The Chippewa River is a controlled stream, having a maximum depth of about 7 feet. The river is deeper at night than in the day-

time, due to the operation of hydro plants and paper mills above.

Major Quantities

The major quantities involved in the construction of this bridge were as follows:

Excavation, structure	2,555	cu. yds.
Concrete masonry	2,674.8	cu. yds.
Barsteel reinforcement	321,206	lbs.
Structural steel	1,642,619	lbs.
Cast steel	28,040	lbs.
Steel forgings	3,640	lbs.
Sheet lead	1,379	lbs.
Zinc plates	75	lbs.
Untreated timber piling	15,620	ft.
Treated timber piles	1,755	ft.
Ornamental metal railing	1,915.87	ft.
Floor drains	22	
Riprap	340	cu. yds.

Personnel

The Chippewa River Bridge is a unit in the 7.34-mile Eau Claire Belt Line project, SN-FAP 381-C(3). The contract for the construction of the bridge was awarded to Allied Contracting Co., of Eau Claire, Wis., on its bid of \$258,929.43. H. L. ("Ham") Baker was Superintendent for the contractor throughout the work. E. F. Linster was Resident Engineer for the Wisconsin

Highway Commission for the entire project, with F. E. Burrill as Resident Engineer in direct charge of the bridge operations.

The campaign of United Service Organizations, devoted to bringing recreational benefits to men in the armed forces, opened on May 11 and will continue until July 4, with a goal of \$32,000,000. Give now!

RITECURE

THE "ORIGINAL"

Colorless **C**ONCRETE CURING COMPOUND

Approved for **DEFENSE PROJECTS**

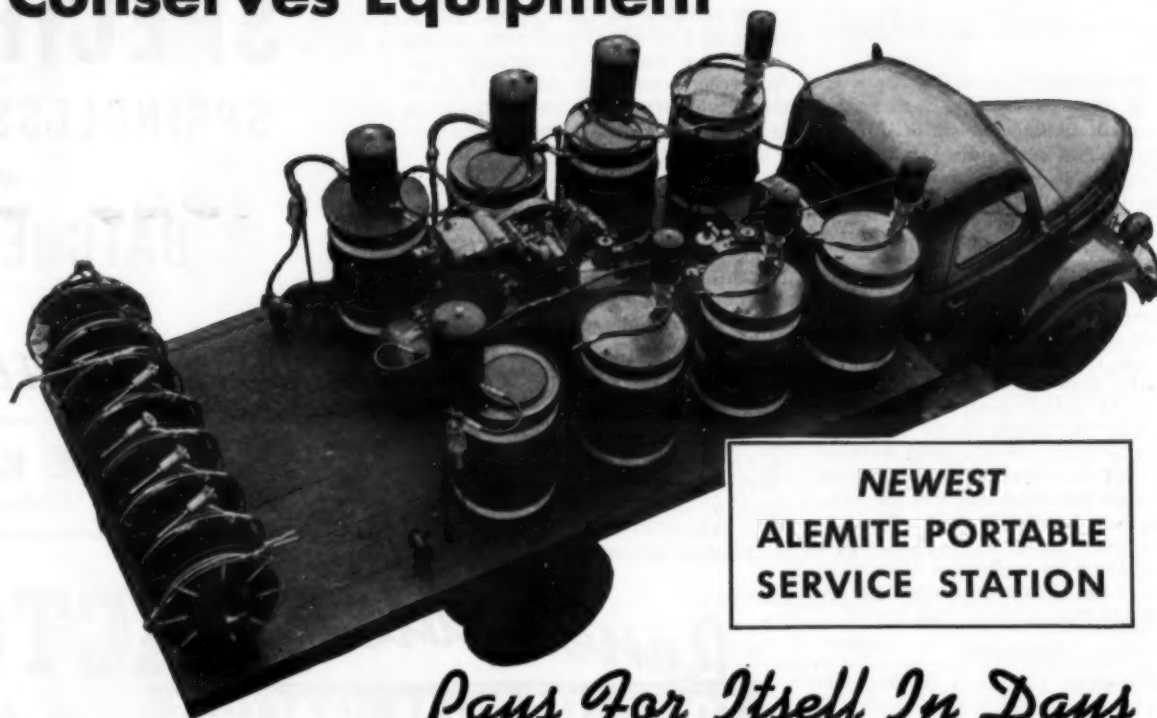
Effective—Simplified—Economical

CURING MATERIALS COMPANY

2130 JANE ST. EVERGLADE 2200 Pittsburgh, Pa.

SPEEDS CONSTRUCTION

Saves Lubrication Time . . . Conserves Equipment



Pays For Itself In Days

TODAY's construction is *all* hurry-up! Every possible short-cut is taken to speed completion. That frequently means *increased* costs—but there is one positive short-cut that *cuts costs*! That's the lubrication short-cut made possible by the Alemite Portable Service Station, which carries Alemite Power Lubrication to the job.

Actual records *prove* that Alemite Portable Service Stations pay for themselves in *days*—long before the completion of a *single project*! Moreover, dependable Alemite Power Lubrication conserves valu-

able machinery by affording added protection against failures and costly delays.

Alemite Portable Service Stations—delivering lubricant directly from 100 or 400-pound drums are available in standard models *completely assembled and boxed in one crate* so that they can be placed in operation within a few minutes. Or assemblies can be made up to meet special requirements. A new catalog is just off the press, offering detailed specifications on a wide variety of set-ups. Mail the coupon *today* for your **FREE** copy.



ALEMITE

REG. U. S. PAT. OFF.

Industrial LUBRICATION

1850 Diversey Parkway, Chicago, Ill.

Belleville, Ontario

Ask Anyone in Industry!

THE STEWART-WARNER CORPORATION
1850 Diversey Parkway, Chicago, Illinois
Please send your new Alemite Portable Service Station catalog.

Name _____
Address _____
City _____ State _____
Firm Name _____

WET Jobs?

Dry Subgrades Guaranteed with

GRIFFIN WELLPOINT SYSTEMS

Whether you Buy or Rent!

BOTH Equipment and Dry Jobs are Guaranteed—
Let us prove that GRIFFIN EQUIPMENT IS BETTER!

GRIFFIN WELLPOINT CORP.

881 EAST 141st ST. NEW YORK, N. Y.

Phone: ME 6-1000 S. 7704 S. 6



Delivering and spreading the asphalt plant mix for the surface of the Camp Haan access road.

New Camp Access Road Rushed to Completion

(Continued from page 21)

ed 6,000 tons of plant-mixed surfacing laid 3 inches thick over the center 22 feet of the grade. This was prepared in the contractor's commercial plant, 27 miles from the project, and hauled to the job in a fleet of eighteen Ford, International and Chevrolet dump trucks.

The specifications for the plant-mix aggregate were as follows:

Square Mesh Screen	Per Cent Passing By Weight
3/4-inch	100
1/2-inch	95-100
No. 4	65-85
No. 10	35-50
No. 20	20-30
No. 40	5-12

Hot asphalt to the amount of 4.5 per cent by weight was dumped in with the dried aggregate while the mixture was turning in the pugmill and mixing continued until the particles were evenly distributed and each particle uniformly coated with asphalt.

A spreader box distributed the material evenly, and when the surface was level to within 1/4 inch in 10 feet, the road was rolled first by a pneumatic-tire roller, followed by a small Buffalo-Springfield roller until the material could take the weight of the large 12-ton 3-axle Buffalo-Springfield machine which did the final compacting after about half the heat had left the mix. Rolling continued until the surface was of uniform texture and of maximum compaction. No traffic was allowed to pass over the freshly-compacted surface until it had thoroughly set and cooled.

Personnel

The contract for this 7,900-foot section of access road was awarded to Oswald Brothers, Los Angeles, Calif., for whom S. L. Johnson was Superintendent. For the California Division of Highways, R. W. Bergman was Resident Engineer, assisted by Wallace Ford.

Westinghouse Sales Head

B. W. Clark, Vice President in charge of the Westinghouse Electric & Mfg. Co. Merchandising Division, has been appointed Vice President in charge of sales of the company, succeeding Ralph Kelly, who resigned to become Execu-

tive Vice President of the Baldwin Locomotive Works. In addition to supervising the sale of apparatus, Mr. Clark, who is also president of the Westinghouse Electric Supply Co., will be responsible for coordinating all sales of the Westinghouse Co. and its subsidiaries, and will transfer his headquarters from Mansfield, Ohio, to Pittsburgh, Pa.

Advertising Signs Reduced by Contract

(Photos on page 52)

The standard form of right-of-way contract used by the Mississippi State Highway Department has been most beneficial to the state as a whole in reducing the number of unsightly advertising signs on state highways. Where new work is undertaken involving the acquisition of additional or new right-of-way, the standard contract includes an agreement between the property owner and the State Highway Department that no advertising signs will be erected on the owner's property within 150 feet of the center line of the highway.

This has resulted in great improvements in the newer highways, with the exception of approaches to the densely-built-up sections of cities. Within city limits, in certain instances, the State Highway Department does not take any right-of-way, but merely uses the city streets as its highway. This still leaves unsightly blots on the landscape as one enters a city.

The illustrations on page 52 show the south entrance to Hattiesburg, Mississippi, on U.S. 11, as seen after one has driven for many miles through sign-free scenery and has crossed U.S. 49 through a well-designed and attractively landscaped underpass at the center of a cloverleaf.

Waterproofing Material For Bituminous Paving

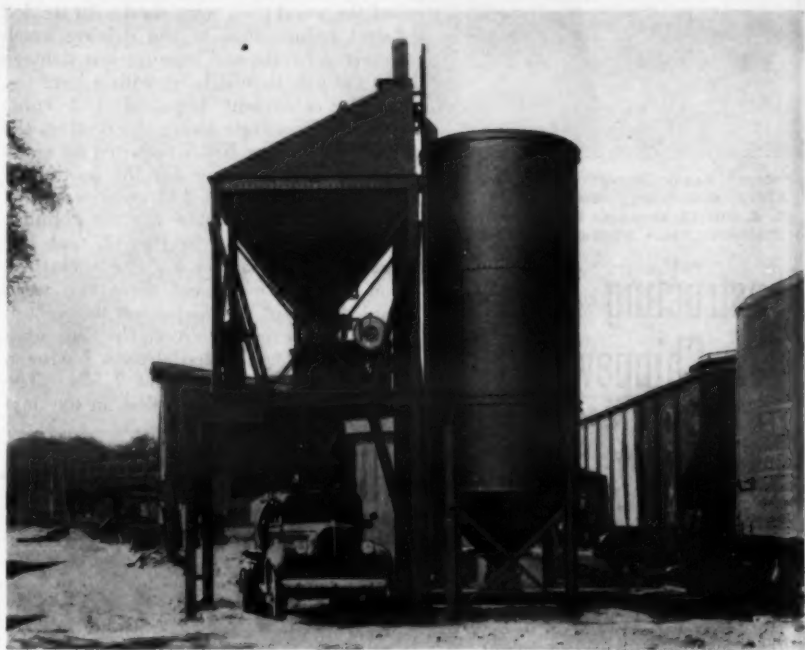
A problem in mixing and laying bituminous paving is moisture. It is necessary to dry the aggregate, or wait for it to dry, so that the bitumen will adhere firmly. The road surface also has to be dry before the mixture can be laid and often, after laying, pavements have broken down prematurely because of too low a resistance to moisture. "Waterproof the aggregate, bind the bitumen, save the road" declares the Kotal Co., 52 Vanderbilt Ave., New

York City, on the cover of a new booklet devoted to its waterproofing material known as Kotal.

Kotal, a liquid chemical combined with lime, forms on the aggregate a plastic-like compound which is claimed to be adhesive, durable and waterproof. In the stockpile Kotal-treated plant

mixes and aggregates are ready for immediate use regardless of weather, climate or season, according to the manufacturer.

Copies of this illustrated booklet describing Kotal waterproofing and its applications may be obtained by writing direct to the manufacturer.



SPECIFY KRON SPRINGLESS DIAL SCALES

on your

BATCHER PLANTS

for

ACCURACY—SPEED—DEPENDABILITY

THE KRON CO.

Bridgeport, Conn.

Renewable TRACTOR RIMS FOR CATERPILLAR TRACTORS



Sturdy steel replacements for Caterpillar Tractor drive sprockets and idlers... Designed for extra long life and heat-treated with proper toughness to guard against breakage... Easily applied on your present equipment at less cost than entire unit... Welding instructions furnished.

ALLOY STEEL & METALS CO.
1862 E. 55TH ST. Lafayette 0181 LOS ANGELES, CALIF.

Manufacturers of PACIFIC CRUSHING & SCREENING UNITS • PACIFIC SLUSHING SCRAPERS & SHEAVE BLOCKS • ALLOY-MANGANESE MILL LINERS & CRUSHER JAWS • PACIFIC ROCK BIT GRINDERS • HAND WINCHES • CRAWLER SHOES, TRACTOR RIMS and other Wearing Parts

Write for BULLETIN

Prolongs Life of Sprockets and Idlers

TARPAULINS ROAD MATS WINDBREAKS

CONTRACTORS' SUPPLY DEALERS in every state will sell the Fulton line. Specify SHURE-DRY and FULTON Tents, Tarps, and Windbreaks—anything made of canvas. Also Fulton Road Mats and Burlap. Fulton products are good and prices are right. If your dealer can't supply you write our nearest plant for catalog, samples and price list.

Fulton Bag & Cotton Mills

Manufacturers Since 1872
ST. LOUIS, MO. NEW YORK, N.Y. NEW ORLEANS, LA. CHICAGO, ILL.

write for prices

Servicing Trucks For Longest Life

Periodic Inspection With Careful Checking of Items As Listed Will Minimize Delays and Breakdowns

♦ WITH the greater part of America's truck production consigned to the armed forces, and with new trucks for civilian use strictly allocated, it becomes imperative that trucks now on the road be kept at their highest peak of efficiency and be made to last as long as possible. Proper maintenance, and in particular preventive maintenance, the "stitch in time" that corrects small troubles before they develop into larger ones, thus assumes even greater importance in the truck operations of every individual, contractor, municipality, township, county and state organization.

To large commercial organizations with hundreds of trucks, particularly those whose revenue is derived exclusively from truck operation, the benefits of preventive maintenance have long been known. Such organizations often have considerable investment in special service tools and invariably give their truck equipment periodic check-ups and adjustments. This is also true of the more progressive state highway departments through their central and district garages and also in many of our larger counties. Other groups operating smaller numbers of trucks have not been able to do such a thorough job so that maintenance often tends to be of a haphazard nature or to be practically non-existent. It is to these smaller organizations, both governmental and contracting, that the following facts on preventive maintenance will be most applicable.

Various Maintenance Plans

Various systems of preventive maintenance are used by large trucking firms and by the different truck manufacturers. One that is both thorough and simplified is that used by Mack Trucks, Inc. A system along almost the same lines has been adopted by the United States Army for the efficient maintenance of its fleets of trucks now going into service. The Mack schedule of preventive maintenance incorporates an agreement between the owner and the truck manufacturer, but where this is not possible the same inspection system can be applied to any make of truck and, with permission of Mack, we are listing the steps below for the benefit of any of our readers who may wish to adapt such a system to their own particular needs.

This system calls for periodic inspections at succeeding 1,500-mile intervals, with special and more extensive adjustments at each succeeding 6,000 and 18,000-mile mark.

1,500-Mile Service

The 1,500-Mile Interval Service calls for the following at every 1,500-mile period:

ROAD TEST For running condition; report defects.



"Keep 'em rolling" applies to trucks in civilian service too. Preventive maintenance, such as described in this article, will make possible many additional thousands of miles of uninterrupted service.

ENGINE

CRANKCASE
OIL FILTER
OIL PRESSURE

While warm inspect for fuel, oil, water leaks, and tighten. Change engine oil. Replace if bag-type. Check and report.

AIR FILTER
FAN BELT
DISTRIBUTOR

Wash in kerosene and oil. Check and adjust as required. One turn grease cup using BRB Grease (Ball and roller-bearing grease).

GENERATOR

Add 8-10 drops light engine oil, or one turn grease cups with ball and roller-bearing grease.

BATTERY

Check gravity. Add water. Clean and grease terminals.

CLUTCH

Adjust pedal free motion if necessary. Add BRB grease to release bearing if not pre-packed.

TRANSMISSION DRIVESHAFTS

Add chassis-lube to yoke shaft. Add gear oil to level. Add gear oil to all open-type universal joints. Add short-fibre grease to slip splines. Add BRB grease to center bearing.

STEERING

Add gear oil to level of plug. Inspect drag link and drop arm, and add chassis lube. Inspect tie-rod, and add chassis lube.

SHOCK ABSORBERS

Add chassis lube to knuckles.

BRAKES

Add brake fluid to master cylinder to level.

REAR AXLE

Add gear oil to level.

NOTE

Add any other items peculiar to your particular chassis.

REPORT

Any items requiring attention.

6,000-Mile Service

The above check-up is made at each succeeding 1,500-mile interval. In addition, at the 6,000-mile period the following (Concluded on page 43)



ALL MICHIGAN SHOVELS-CRANES are quickly convertible to any standard front-end attachment

MICHIGAN Mobile SHOVELS-CRANES — — for FASTER Construction

Owners are setting records on new construction, on maintenance work, in industrial plants and on scattered operations with the MICHIGAN Mobile SHOVEL-CRANE. Fingertip Air-Controlled clutches enable operators to maintain fast pace without let downs due to operator fatigue. Maximum stability is provided by the low gravity center and low unit ground pressures of Model TMCT-16 (½ yd. Dual Tandem Drive). This complete MICHIGAN unit, mounted on its own specially designed MICHIGAN chassis, is fully described in Bulletin C52. Write for your copy.

The smaller MICHIGAN Model T6-D (¾ yd. Single Axle Drive) is noted for its great productive capacity over a wide range of operations. This single-engined truck-type excavator-crane has its own specially designed and constructed chassis. Like the larger TMCT-16, Model T6-D's great stability is an outstanding feature, as are the Fingertip Air-Controlled clutches. Model T6-D is praised by owners for its low maintenance costs, flexible operation and high output. Bulletin C52-1 tells why. Your request brings full data by return mail.

SPECIFICATIONS Models TMCT-16 and T6-D

Model	Capacity	Weights		Tail Swing	Gross Allowable weight
		Shovel	Crane		
TMCT-16	½ yd.	28000 lbs.	26000 lbs.	7'-9"	35000 lbs.
			to 28000 lbs.		
T6-D	¾ yd.	20500 lbs.	19000 lbs.	5'-8"	26300 lbs.

Bulletin C52-2 contains detailed specifications on Model TMCT-16 (Dual Tandem Drive) designed especially for high-speed crane-work. Model T6-D (¾ yd. Four-Wheel Drive) and Model C-16 (½ yd. crawler) are completely described in Bulletins C52-3 and C52-4, respectively.

MICHIGAN POWER SHOVEL CO.

Benton Harbor

Mich., U. S. A.



The Original BucketruX

Trade **DEMPSTER** Mark
DUMPSTER
Reg. No. 353486

Mfgd. by

DEMPSTER BROTHERS, Inc.
Knoxville, Tenn.

michigan
AIR-CONTROLLED
SHOVELS - CRANES - CLAMS DRAGLINES - TRENCH HOES

Completing Closure At Whitney Point Dam

(Continued from page 18)

on both sides for the rock and with a crown or top 15 feet wide. On the upstream face a gravel blanket was placed on a slope of 1 on 2 to fill the voids in the larger rock and to hold the impervious material which was placed on a 1 on 3 slope and was compacted only by the equipment placing it.

The second stage of the cofferdam was built up to Elevation 980 with a 15-foot top and slopes of 1 on 3 both upstream and downstream. The second stage completely covered the first-stage cofferdam and the center line of the second was at the downstream toe of the first stage.

Stripping and Blanket

Between the upstream and downstream toes of the dam the area drops about 6 feet, making it self-draining. This area was stripped an average of 2 feet deep and a maximum of 4 feet, using a Lorain 77 dragline, a Lorain 77 shovel, and an RD8 with LeTourneau bulldozer. A few pockets of muck and some track were located but these were readily cleared out and carefully back-filled. A Gorman-Rupp 2-inch self-priming pump was used to unwater the last section of the dam below the cofferdams as stripping progressed. The Lorain 77 shovel worked on mats loading to three Euclids, and a Cletrac 80 with a bulldozer was used to move the Euclids when stuck in the mud. The material stripped from this area was either wasted or placed in stockpiles, if satisfactory, for later use within the dam. The entire area was backfilled with selected material to a depth of 4 feet, and greater where pockets occurred, to form an impervious blanket beneath the dam.

Following its work on stripping, the Lorain 77 dragline was used on the extension of the core trench, loading to three or four Euclids.

Completing the Closure

The placing of the final 600,000 cubic yards of material in the closure section of the dam was required to be completed within the 1941 working season, which ended November 15. The contractor set up his operations to move 200,000 cubic yards of material per month to insure meeting this requirement. The operations were similar to those in placing material in the dam proper, with the exception that in the stream bed a layer of 6 feet or more of selected impervious material was laid free of 6-inch or larger stones. Where these appeared in the 6-inch layers as spread, they were broken down by hand and the pieces scattered over the surface.

Two separate outfits were used in spreading material on the closure section. The first of these was a group of Model RU 30-yard Carryalls pulled by RD8 tractors on a 500-foot haul while the second unit consisted of a Lorain 77 shovel loading to a fleet of bottom-dump Euclids operating on a 1,000-foot haul. All of the material was spread in 6-inch layers by an RD8 with a LeTourneau bulldozer and then compacted by a Cle-

trac 80 pulling two sheepfoot rollers. On the section over the stream bed another Cletrac 80 was used solely for compaction, the specifications giving credit for complete compaction with six passes of the tractor. This tractor was also used to assist trucks in soft ground and on steep grades. In order to maintain the proper moisture content for maximum compaction, two 750-gallon tanks were mounted on two old truck chassis and used for sprinkling the layers as spread.

As the work on the dam continued 24 hours a day, adequate lighting was a necessity. This was taken care of by high lines extending throughout the entire area of operation, including the dam, spillway and intake areas. These high lines supported large floodlights which could be moved along the high lines to concentrate illumination at any one spot and also could be raised and lowered.

Major Quantities

The estimated quantities and unit prices bid on major items involved in the construction of Whitney Point Dam were:

Item	Quantity	Unit	Contract Price
Stripping	65,000 cu. yds.	"	\$ 0.78
Common excavation	2,600,000 "	"	0.29
Rock excavation	113,000 "	"	0.62
Tunnel excavation, unclassified	13,400 "	"	11.23
Backfill, compacted	100,000 "	"	0.48
Class 1, 2 and 6 materials	1,235,000 "	"	0.06
Class 3 materials	375,000 "	"	0.055
Class 4 materials	36,000 "	"	0.05
Class 5 materials	875,000 "	"	0.02
Placing dumped riprap	15,000 "	"	0.45
Furnishing and placing dumped riprap	35,000 "	"	2.19
Furnishing and placing derrick stone	6,100 "	"	3.35
Gravel and crushed rock cover	33,000 "	"	0.60
Gravel for riprap backing, drains and filters	42,000 "	"	0.70
Crushed rock or gravel in downstream toe drains	40,000 "	"	0.60
Furnishing and placing rock in upstream toe	9,000 "	"	2.05
Class A concrete in tunnel	6,400 "	"	17.22
Class A concrete in structures	900 "	"	19.73
Class B concrete	36,500 "	"	13.66
Steel, concrete reinforcing	1,370,000 lbs.	"	0.06

Personnel

The contract for the construction of Whitney Point Dam and appurtenant works was awarded to The Hunkin-Conkey Construction Co. and Shofner, Gordon & Hinman on the bid of \$2,678,278.80. The work was done from plans and specifications of and under the direction of the Binghamton, N.Y., District Office, U. S. Engineer Department, Lt.-Col. J. C. Marshall, District Engineer, with F. R. Deland as Resident Engineer. For the contractor, the work was in charge of J. M. Sawyer as Superintendent.

Wickwire Spencer Officer

Carl I. Collins, who in 1935 became manager of operations for the Worcester District of the American Steel & Wire Co., with mills in Worcester, Mass., New Haven, Conn., and Trenton, N. J., resigned that position upon his recent

election to the Board of Directors of Wickwire Spencer Steel Co. He has now been named Executive Vice President of the company. Mr. Collins has had a wide experience in the steel business since graduating in Mechanical Engineering from Georgia Tech prior to the first World War.

PARSONS TRENCHERS



MORE DITCH NOW!

TIME IS VALUABLE—faster ditching means sooner airports, cantonments and Victory plants. MORE PLANES, POWDER, GUNS and SHIPS.

PARSONS TRENCHERS are helping to maintain the unthought-of building schedules in today's Victory program.

FOR SPEED—clean and deep digging, low maintenance cost, PARSONS has been established as a standard in the trenching machine field for over 35 years.

MORE DITCH PER MINUTE ASSURED—BUY PARSONS.

WE'LL MOVE THE
EARTH
TO SERVE YOU

THE PARSONS CO., NEWTON, IOWA

JOHNSON ROADBUILDERS' ELEVATING CEMENT CHARGER

- 100% HIGHWAY PORTABLE UNIT
- ONE MAN OPERATION
- MEETS ALL STATES' SPECIFICATIONS
- FAST AND FLEXIBLE

- ★ Meets all highway specifications. Wheels, equipped with Timken Roller Bearings with stand any towing speed.
- ★ All controls are within easy reach of operator's platform.
- ★ Average batching time is fifty seconds for a two hatch truck.
- ★ Can easily be converted into an efficient transfer plant or a charger for truck mixers. Can be towed and set up anywhere a truck will go.

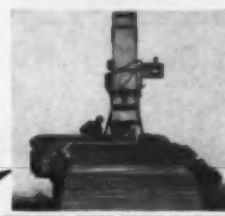
- ★ 25-bushel receiving hopper gives adequate storage for car change and minor delay



ELEVATING CHARGER IN TOWING POSITION



CHARGING A TRUCK MIXER



WITH HOPPER—WHEN CEMENT IS DELIVERED BY BULK CEMENT TRUCKS

JOHNSON
PRODUCTS
Bins — Batchers —
Scales — Central Mix
Plants — Bulk Cement
Equipment — Concrete
Buckets — Roadbuild-
ers' Equipment — Sites
and Storage Bins.

For Further Details Write C. S. JOHNSON CO. Champaign, Illinois



ROETH Concrete Vibrators

The model shown has a vibrator speed of 6000-7000 r.p.m.; 4-hp. 4-cylinder 1-cylinder air-cooled gasoline motor, mounted on a heavy-duty frame or wheelbarrow chassis. A complete line available.

Write for illustrated circular
ROETH VIBRATOR COMPANY
1737 Farragut Ave., Chicago, Illinois



Improved Wonder diaphragm pump.

Diaphragm Pump Line With New Features

There are many types of pump service, such as handling mud, sludge, seepage, sewage, etc., which call for a diaphragm pump. The Construction Machinery Co., Waterloo, Iowa, states that its line of diaphragm pumps has achieved new efficiency in the improved models recently announced.

Among the features of these CMC Wonder pumps are Timken-bearing construction, full-finished roller-chain drive, completely enclosed cut-tooth sprockets, an improved-type long-service basket-weave diaphragm, and inter-usable suction, discharge and clean-out locations. These Wonder diaphragms are available in two sizes: the 3-inch Model FD-3 with a capacity of 3,000 gph at a 10-foot suction lift or 1,500 gph at a 20-foot suction lift and powered by a 2½-hp engine; and the 4-inch Model FD-4, with a 3½-hp engine and a capacity of 6,000 gph at a 10-foot suction lift or 3,000 gph at a 20-foot suction lift.

Complete information on these improved diaphragm pumps may be secured by those interested direct from the manufacturer by mentioning this item.

Spreaders and Finishers

Well-illustrated bulletins filled with pertinent data on the operation of the Blaw-Knox Model XC finishing machine and the B-K concrete spreader have recently been issued by Blaw-Knox Division, Blaw-Knox Co., Pittsburgh, Pa.

Bulletin 1847 on the finishing machine and Bulletin 1851 on the concrete spreader will be furnished free on request to readers of CONTRACTORS AND ENGINEERS MONTHLY writing direct to Blaw-Knox and mentioning this item.

THE MOST IMPORTANT UNIT FOR AIRPORT RUNWAY CONSTRUCTION



Whenever there is mixed-in-place construction such as soil-cement, bituminous, etc.

It does the job thoroughly, rapidly, and economically.

It operates with other general purpose road equipment—from power take-off shaft of any suitable tractor—easy and safe to operate. The swirling chopping action of Aggmixer tines does a thorough job of mixing—wet or dry. Send for job facts now.

**ARIENS COMPANY,
BRILLION, WISCONSIN**

Removing Guesswork From Slope Cutting

Engineers' stakes are the guideposts for accurate slope cutting, be it back-slopes, the sides of fills, or flat shoulder slopes. The equipment now used for such work includes power graders, carry scrapers and bulldozers. The accuracy of performance of each of these units depends on the skill of the operator between stakes. If the wheels or crawlers of the equipment are at different elevations, it is exceedingly difficult for any operator to do an accurate job.

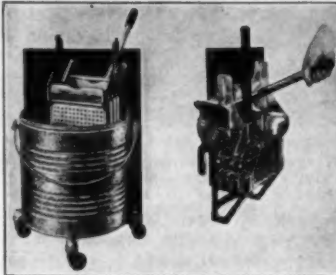
Much of this difficulty has been eliminated and accurate work made possible by the Slope-Meter, a completely sealed precision instrument which is permanently affixed to the frame of the machine. The arc dial of the Slope-Meter is marked with large figures to represent slope and with small triangles, representing degrees. By holding the blade, bulldozer or cutting edge of the scraper to the proper slope, the need for refin-

ishing slopes is minimized.

Installing two Slope-Meters on a tractor equipped with a bulldozer, one lengthwise to indicate the proper slope when finishing the side of a fill or cutting a backslope, and one mounted on the body of the tractor transversely to measure tilt, permits the cutting of flatter slopes by running across the face of them. These meters make possible the accurate cutting of slopes at night,

and in any kind of weather, as the Slope-Meters are hermetically sealed against rain, dust, snow or sleet.

An illustrated data sheet and complete instructions for the installation of Slope-Meters on equipment and on boards for hand checking will be furnished promptly by The Slope-Meter Co., 1014 E. 25th St., Minneapolis, Minn., to those referring to this descriptive text.



**GEERPRES WRINGER, Inc., P. O. BOX 152
MUSKEGON, MICH.**

Complete line of Mop Wringers, Mop Buckets (Rubber casters), Mop Tr. cks (Twin type), Tangleproof Mop Sticks.

Amazing Service Records

Doubles Mop Life—Saves Work—Saves on Cleaning Compounds—No Splashing—Saves Floors

Illustrated here is just one of the striking GEERPRES features: Overlapping staggered gears which completely eliminate side-slip and insure smooth operation.

Geerpres Units are 30% lighter, with stronger arc-welded construction. Permanently rust resistant. **EXCEPTIONALLY LONG LIFE.**



...AND SPEED YOUR OWN ASPHALT DELIVERIES, TOO!

● Today, unprecedented quantities of bituminous materials are urgently needed for defense highways, airports and access roads. Tank cars for asphalt deliveries are vitally important. How can these increased demands be met with the limited supply of cars available?

You can help answer that—and speed your own asphalt deliveries, as well. Keep your tank cars rolling. There are four simple ways suggested here. The Standard Oil Asphalt representative in your locality will work with you in developing plans to meet this emergency. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the representative nearest your job.

OIL IS AMMUNITION USE IT WISELY

© 1942

*Asphalt for
every purpose*

STANDARD OIL COMPANY
(INDIANA)

4 ways you can help keep tank cars rolling

1. **Accurately estimate your asphalt needs** when placing yearly contracts. An extremely high estimate may force your supplier to hold large stocks and delivery facilities open which others might need.
2. **Carefully plan delivery schedules**, as far in advance as possible, so that your supplier and your railroad can be sure that transportation is available when you want it.
3. **Speed up unloading** by scheduling deliveries when your crews and equipment are available.
4. **Release empty cars.**

Stonycreek Channel Widened and Deepened

(Continued from page 1)

widening, deepening and realigning the channel of Stonycreek River preparatory to paving the slopes and building a short section of flood wall.

The Operation

The river channel, which was excavated generally, has about 3 feet of gravel over rock for the first 2,000 feet and then all sand and gravel beyond this point. The rock is a gray or blue laminated shale which requires blasting for breaking. The new channel is 171 feet wide at the toe of the paved slopes which are at an angle of 1 on 1½ with a 3 x 2-foot toe wall and the slab varying in thickness from 8 inches to 2½ feet at a bad curve where there are high velocities.

The general method of operations by the contractor was first to excavate a section of the river to grade. This section cut to grade, approximately 30 feet in width, was used as a drainage channel. The contractor was at liberty to swing this channel and dikes back and forth across the stream bed as he saw fit to carry on his operations. By digging this drainage channel to invert grade, the contractor could excavate and pour the footing foundations in the dry and reduce pumping costs. By taking a section of the river bed to grade the first time, it was not necessary to divert the river a second time for excavation in the same locality. The drainage channel was usually at one side of the center line, leaving a central dike which aided in diverting the water to the already excavated channel. This central section was generally stripped of overburden down to rock and used as a roadway for equipment until it was time to drill, blast and excavate the material.

On the other side of the river, the channel was excavated to grade by drilling holes on 3-foot centers and up to 12 feet deep, using Ingersoll-Rand wagon drills. At the toes of the paved slopes, trenches 3 feet wide x 2 feet deep were line-drilled with the holes on 3 to 4-inch centers and then blasted with fractional sticks of explosives or opened up with paving breakers if the rock was not too hard.

The slopes of some sections were not paved, such as a section of 3,023 feet upstream of the Conemaugh Street Bridge extending approximately to the Napoleon Street Bridge, where the left bank was left unpaved because the city plans in the near future to build a boulevard along that section and may wish to encroach on the river slightly and therefore build a wall to save space for the boulevard area.

Drilling and Excavation

The contractor used one Sullivan 800-cubic foot compressor, two Ingersoll-Rand compressors of 660 and 800-cubic feet capacity, and one Gardner-Denver compressor of 220-foot capacity for operating the Ingersoll-Rand Jackhammers and wagon drills. All of the drilling was done with I-R Jackbits which produced about 20 feet of hole in the shale before requiring resharpening. In the deeper holes, full sticks of 40 per cent du Pont dynamite were used, fired with a hand blasting machine shooting as many as 20 to 30 holes at one time. Du Pont electric blasting caps were used. Woven steel-cable mats were used to cover all areas when fired to prevent scattering of the rock and damage to adjacent buildings or "sidewalk superintendents". The rock broke unusually well, there being a remarkable absence of large rock which would require mud-capping. Because of the danger from mud-capping, the contractor used a 4,000-pound skullcracker to reduce the



C. & E. M. Photo

Spill from channel excavation at Johnstown, Pa., was hauled to this ravine close to the river and used to fill 3,000 feet of the ravine to a maximum depth of 60 feet.

larger rock for easy handling by the excavating equipment.

The excavation in the channel was handled by two Marion 2-yard shovels and one Lorain 77 with Amsco buckets, which loaded out to hired Mack 6-yard trucks. To aid the shovels in gathering the material, a D8 tractor with a LaPlant-Choate bulldozer was used to move the broken material close to the shovel. For miscellaneous work the contractor also had a Link-Belt crane with a 45-foot boom and a 1¼-yard Owen clamshell bucket. This excavating outfit moved about 2,000 yards of rock in difficult going per 24 hours.

Inasmuch as work during the night would be concentrated for a comparatively short time in one spot and then be moved to another section 200, 300 or 800 feet away, the contractor developed a very mobile lighting plant. It con-

sisted of a Kohler 800-watt gasoline-driven generator mounted on a flat-body truck with a heavy wooden frame over the plant on which were located two Westinghouse floodlights adjustable so that the light could be sent in any direction desired.

The Spoil Area

The contractor was unusually fortunate in securing a dump, about 3,000 feet long and varying from 100 to 85 feet wide and a maximum of 60 feet deep, for the large amount of rock excavation. This area was about ¼ mile from the lower end of the section. On the dump he used a Caterpillar No. 11 power grader to maintain the road so that the heavily loaded trucks could make the hill as easily as possible, and then a D8 tractor with a LaPlant-Choate bulldozer pushed over the loads on the

dump. The contractor used from 12 to 16 trucks on the minimum haul of about 1 mile, and up to 25 trucks when three shovels were running and the haul was at the maximum of about 4 miles because of the different routing necessary.

Quantities

Unclassified excavation	615,000 cu. yds.
Special rock excavation	3,600 cu. yds.
Special excavation	2,000 cu. yds.
Fill	32,000 cu. yds.
Gravel backing	11,000 cu. yds.
Rock fill	4,600 cu. yds.
Concrete	27,000 cu. yds.
Furnishing and placing reinforcing steel	1,540,000 lbs.
Furnishing cement	34,500 bbls.
24-inch vitrified tile or concrete pipe	730 lin. ft.
Drilling 3-inch holes	280 lin. ft.
Furnishing new C.I. pipe, fittings and special castings	44,000 lbs.
Installing 12-inch C.I. pipe	340 lin. ft.
Installing 20-inch C.I. pipe casing	24 lin. ft.
Installing 24-inch C.I. pipe	192 lin. ft.
Removing 6-inch C.I. pipe	200 lin. ft.
Removing 12-inch C.I. pipe	600 lin. ft.
Removing 16-inch C.I. pipe	290 lin. ft.
Furnishing and installing pipe railing	8,300 lin. ft.

Personnel

The contract for the widening, deepening and realigning of the channel of Stonycreek River, with pavement and wall protection of the banks, alterations for certain structures and pipes, and relocations was awarded to S. J. Groves & Sons Co. of Ridgefield, New Jersey, on the bid of \$1,206,245.50. For the contractor, Jack Mathews was Superintendent and C. T. Robertson, Engineer. The work was done under the direction of the U. S. Engineer Dept., Pittsburgh District Office, with C. E. Paul as Project Engineer.

This war is everybody's war and you have a share in it. Play your part in the offensive against tyranny and oppression by buying U. S. War Bonds and Stamps regularly.

REPLACEMENT PARTS

for
**Caterpillar
Tractors**

Sprocket and idler rims . . . Track rollers, shafts, end collars, washers and bushings . . . Track pins and bushings . . . Springs . . . Clutch parts and many others . . . Ready for immediate shipment . . . Write for our catalog.

Manufactured by

KING MACHINE & MFG. CO.

1171 E. 32nd St.

Los Angeles, Calif.

OVER THIRTY YEARS OF DEPENDABLE SERVICE

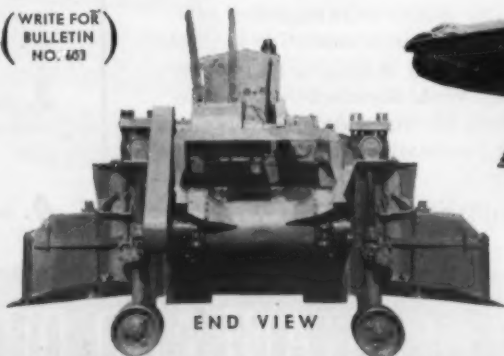
Make YOUR subgrading operations pay a profit:

**A STANDARD Subgrader prepares subgrade
at 50% to 90% saving!**

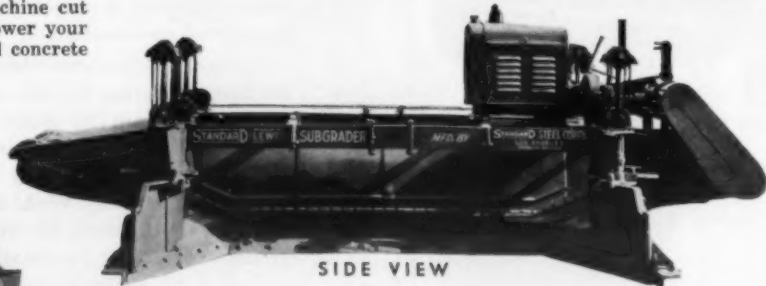
One operator and a helper can prepare subgrade with this machine at the lowest cost ever attained.

Not only does the efficiency of this machine cut down subgrading costs, but it will also lower your costs of rough grading, form setting, and concrete or asphalt placing.

(WRITE FOR
BULLETIN
NO. 403)



END VIEW



SIDE VIEW

And dollar losses due to voids and improper subgrade will be entirely eliminated.

This machine is building most of the airports in the West. Detailed records to substantiate this claim are obtainable from contractors using these subgraders. Write us for further information.

STANDARD STEEL CORPORATION 5001 So. Boyle
Los Angeles



C. & E. M. Photo
Pushing the "mule" to finish lip curb
on the Hallett Construction Co. con-
crete-paving contract on U. S. 52
through St. Cloud, Minn.

Fast Concrete Paving On Minnesota Route

(Continued from page 14)

excess dirt to complete the fine grade and left it in piles for removal by the rotary scraper. The forms were given a firm foundation by a Lakewood mechanical form tamper after which one man was kept busy oiling the forms. The fine grade was rolled by a Fordson roller to good compaction but the batch trucks rather tore it up ahead of the paver. The trucks entered the grade through a break in the forms, drove up to a turntable and then, after being given a ride on the merry-go-round, backed to the paver.

Steel and Joints

The standard Minnesota reinforcing, expansion and contraction joints were used on this contract. The center steel on either side of the center joint consisted of $\frac{3}{8}$ -inch round deformed bars, placed 10 inches on either side of the center line of the pavement, and to which were wired $\frac{1}{2}$ -inch round tie bars 24 inches long and spaced 3 feet apart. On this contract the chairs for holding the center steel $3\frac{1}{2}$ inches above the subgrade were placed on thin wood so that they would not cut into the subgrade and cause the steel to be too low. Similarly, wood was placed under the setting device for the contraction and expansion-joint steel.

The contraction joints were placed every 20 feet in the pavement and expansion joints every 120 feet. The contraction joints carry reinforcing consisting of a transverse bar which extends from the edge of the slab to the center line and is made up of a $\frac{3}{8}$ -inch round deformed bar $6\frac{1}{2}$ inches on either side of the line of the contraction joint, with $\frac{3}{4}$ -inch round oiled dowels 15 inches long tied to the transverse bars and spaced 1 foot 3 inches apart. The contraction-joint steel was set by a standard setting device specified by the Minnesota Highway Department. The concrete around the steel was vibrated by a Master mechanical vibrator mounted on a pedestal so that the power plant could be carried right into the concrete, before

the setting device was removed.

The expansion joint has the same reinforcing as the contraction joint but, instead of being merely a slot cut $2\frac{3}{8}$ inches deep by a hand cutter, is formed as an open slot the full depth of the pavement. Later the bottom $1\frac{1}{2}$ inches was poured with an asphalt mastic containing diatomaceous earth. On top of this, granulated cork was hand-tamped to within $2\frac{1}{8}$ inches of the top of the slab and then this was poured with the same type of mastic used to seal the bottom.

Paving and Finishing

The batch trucks delivered their loads to the skip of a Koehring 27-E paver. After the full 60-second mix the concrete was delivered to the subgrade where three puddlers distributed it in front of the Ord 2-screed finishing machine, which made two passes over the concrete to insure the proper finish and crown. On the second pass the finishing machine pulled the Cleft-Plane machine which cut the center slot for inserting the 5-foot steel caps to form the slot in the pavement along the center line. The Cleft-Plane machine carried a wide pan at either side sloping toward the outside where a hole in the bottom drained into a small tank on the outside. This made it easy for the men, who returned these caps after they were removed from the pavement by the finishers, to clean them, place them in the pans and quickly oil them, knowing that the oil would not be wasted as it would drain back into the side tanks.

Next followed the bridge for the longitudinal float men who used a 10-foot float, working it from side to side to take out transverse ridges in the pavement and to remove laitance.

The two finishers used long-handled floats, followed first by a drag straight-edge, and then pulled an 8-inch canvas belt to give the final finish to the surface. Lip curb 3 inches high was built on the inside against the narrow dividing island. This curb was built by one man placing concrete, one man wheeling concrete back from the paver and one finisher who floated the curb by hand and then pushed the sheet metal "mule" over the top to insure the exact form specified, which is 2 inches wide at the top where the curb is 3 inches high and then feathered to nothing at 16 inches from the side on a 3-foot radius.

The finishers lifted the contraction-joint steel which had been set from the Cleft-Plane and then one man on a roll-

ing bridge pulled and edged both the transverse and longitudinal joints, using the steel as a guide. The pavement was then broomed and edged and covered with 60-foot rolls of Sisalkraft paper weighted at the edge with dirt. Two men from the fine-grade crew were kept back to turn up the edge of the paper and pull the forms, after which they turned the paper down against the sides and banked earth against it so that it would not blow up in the high winds.

Personnel

This paving contract which was completed by Hallett Construction Co. of Crosby, Minn., was done under the direction of I. R. Sewell, Superintendent. For the Minnesota Highway Department, J. J. Idzorek was Resident Engineer.

Proper lubrication is no longer merely a matter of economy; it is now a patriotic duty to keep your equipment on the job, well-lubricated and operating at maximum efficiency.

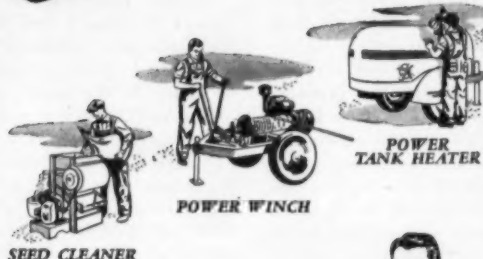
All-Wheel-Drive Trucks Described in Bulletin

Marmon-Herrington Co., Inc., Indianapolis, Ind., converts all standard Fords into two types of vehicles with increased power, traction and maneuverability: a 4-wheel all-wheel-drive or a 6-wheel all-wheel-drive unit. Such trucks have power and traction applied through all wheels, giving all the performance of standard Fords plus greater safety in the positive steering and anti-skid action of four or six wheels grasping the road instead of two. This conversion combines lower gear ratios with pulling power, maneuverability, stamina and economy of operation. Larger tires increase flotation and clearance, and heavier front springs for snow-plow work are available.

A copy of a new catalog containing complete details and many illustrations of the Marmon-Herrington line may be obtained by writing direct to the manufacturer and mentioning CONTRACTORS AND ENGINEERS MONTHLY.



These machines are representative examples of the wide variety of applications of Briggs & Stratton motors.



USERS . . . of Gasoline-Powered Equipment know the Power is right when powered by "Briggs & Stratton."



Known to millions — the Briggs & Stratton trademark on the motor of gasoline-powered equipment is a distinctive emblem of dependable, economical, easy starting power . . . Trouble-free performance on a vast variety of machines, tools, and appliances — in governmental service, on farms, and in industry — has earned an extraordinary recognition for Briggs & Stratton air-cooled gasoline motors.

BRIGGS & STRATTON CORP.
Milwaukee, Wisconsin, U.S.A.

WHERE GOING IS
Tough
GATKE
High-Heat-Resisting
Asbestos
BRAKE MATERIALS
Stand Out



GATKE Brake Blocks and Frictions — Moulded to machined accuracy in ALL shapes and sizes — LARGE or small.

GATKE MAKES
Brake Lining
Clutch Facings
Frictions
Non-Metallic
Bearings
Sheet Packing

GATKE High-Heat-Resisting Brake Materials take more punishment because they are made for tough service — using materials and processes developed thru 28 years of specialization.

They are specially engineered by men who understand service requirements for every Brake and Clutch application of Excavating, Road Building, and Construction Equipment.

Just tell us what you need.

GATKE CORPORATION

224 N. LaSalle St.

Chicago



C. H. & E. MANUFACTURING CO.
3810 No. Palmer St., Milwaukee, Wis.

District Repair Garage In St. Louis County

(Continued from page 24)

Lake has been chosen for description because it is typical of the others, is one of the larger units, and was not too far distant from Duluth for easy inspection. It is a 59 x 171-foot concrete-block structure stuccoed on the outside and with a 4-ply tar and gravel roof. It is entered through a 12 x 18-foot overhead door with a similar one at the rear of the garage for entry to the repair shop. On the right at the front is an office for the District Superintendent and a clerk, as well as a separate office for the Shop Foreman. At the left is a wash rack with the grease racks close by, and a tank for washing parts to be repaired. Diesel fuel cut with gasoline is used for cleaning parts. A work bench runs the full 60-foot length of the shop, and carries the usual equipment of hand tools, as well as a tire patching outfit, and vises. An overhead trolley at a suitable distance away from the bench operates on a monorail, carrying two Hercules hoists of 5 and 2-tons capacity. At the end of the bench is a small grinder and a valve resurfacer.

Back of the offices is the storeroom for parts where every item is charged to stock and charged to the equipment when it is issued. All small parts are stored in steel bins, giving a large amount of storage in very small space. Adjacent to this is the oil room with a monorail and hook for use in emptying the large oil tanks. A vacuum fan run by motor through the belts gives a quiet ventilating system for the shop. The quietness of operation makes it possible to have it running in the parts room without bothering the employees and mechanics.

In the basement are two boilers with power-operated stokers providing low-pressure vapor heat for the unit heaters in the shop and garage.

Additional shop equipment includes a Manley 50-ton hydraulic press, a lathe, power grinder, power hack saw and power band saw, a brake-band riveter, and an automatic drill and counter-sink for brake-band operations. There is also a heavy-duty drill press.

Back of the repair shop is the black-



C. & E. M. Photo
The Adolph Patrol Garage, typical of the small county-owned storage garages located in most of the districts in St. Louis County, Minn.

smith shop, where there are three acetylene welders, one electric arc welder, a power threader, a monorail with 2-ton Hercules hoist, a 200-pound power trip-hammer and other miscellaneous equipment.

Adjacent to the new garage is a galvanized-iron warehouse, where is stored a Schramm truck-mounted compressor, which is used for operating jackhammers and also the center-line air-operated striper. A Clyde friction hoist, with a Waukesha motor, for pile driving and for the operation of a slack-line cableway is also stored in this warehouse. A section for the storage of larger parts and parts with a slow turnover is set aside in the basement of the main garage where the heaters are located, and there also are the water tank and well providing a complete domestic water system. The garage compressor is also located adjacent to the heaters.

The old original shop on this site is now used for oil and tire storage with a mezzanine for the storage of brake lining, tires and large parts. The culvert steamer which furnishes steam at 60-pounds pressure is also stored in this building.

A concrete dynamite house has been built on the same plot for the storage of a small quantity of dynamite. The electric caps are kept in the storehouse.

In the basement of the warehouse, Patrol Sections 1 and 2, which operate from the main district garage, have a wired stock room for equipment charged to them. In the main garage at the end of the work bench is a sign shop, where all county-road signs with the county's distinctive symbol are painted. Warning signs are now being made with Prismo backgrounds, using the special rolls of Prismo beads already fixed

to the cloth background for the signs around the lettering.

A Patrol Garage

The Adolph Patrol Garage of the Fifth District is typical of the buildings throughout the county. It has three wide lift doors to permit equipment to enter readily, and at the right is a storeroom for a small truck. In this room are lockers, a hot air coal-fired heater, and a wooden mezzanine at the back

where patrolmen may sleep in winter when snow plowing requires very long shifts. In the large open section for the two large trucks, drums of oil and grease are stored, and there is an underground gasoline tank sufficient to care for the needs of the equipment working from this patrol garage.

The garages are all deep enough for the large heavy-duty power patrol graders to enter and be kept warm when not in snow-plowing service in winter. The snow plows are overhauled at the District Garage in summer, and are stored in the patrol garages in winter.

Motor Grader Kills Foreman

Out on a job where they were processing soil-cement with a motor patrol grader, a foreman was seriously injured trying to climb up onto the grader when it was moving along at about 6 miles per hour. His foot slipped and the grader ran over his body, fracturing his pelvis.

Construction Safety calls attention to the fact that this foreman violated the rule that he was expected to enforce—don't climb onto moving equipment.

How to get the highest contraction joint performance at the lowest cost:—

SPECIFY

KEYLODE
CONTRACTION JOINTS

Easily Aligned
Designed for Speed
Work with Any Machinery
Hold their Alignment

WRITE FOR DESCRIPTIVE CIRCULAR



HIGHWAY
Steel Products Co.
CHICAGO HEIGHTS
ILLINOIS



GENERAL SUPERCRAANE!

GENERAL

SUPERCRAANES are selling faster than we can build them. Still, now is a good time to find out how you can save with a SUPERCRAANE.

Why Super? Because it's better! — Because it requires but one operator, and has but one engine — yet is mounted on rubber tires, steers hydraulically, moves without tracks or overhead connections — goes most anywhere. The SUPERCRAANE will handle more material faster, easier, and for less cost. Available as Crane, Clamshell, Dragline and Pile Driver.

GENERAL GIVES YOU MORE!

The
OSGOOD
COMPANY

Sizes: 1/2 to 2 1/2 Cu. Yd.
Diesel or Gas Electric
Associated with
The GENERAL
EXCAVATOR CO.

The
HERCULES
COMPANY

HERCULES
"IRONROLLERS"
6 to 12 Tons
Diesel or Gasoline
Associated with
The GENERAL
EXCAVATOR CO.

GENERAL

Sizes:
1/2 - 1/4 - 1/2 - 3/4 Cu. Yd.
Diesel - Gas - Electric
SHOVELS
DRAGLINES - CRANES
Crawler & Wheel Mounted
THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

Dig in with RAZOR-BACK

Here's what contractors are saying about
the ONLY shovel with a BACKBONE

Forged 40% Thicker Up Thru Its Center

"My men have used the shovels nearly 3 months, hard, and they haven't shown any wear yet."

"They are put to hard usage on the roads and render 3 times longer service than the usual brands."

"My men fight to use the Razor-Backs."



Made by THE UNION FORK & HOE CO., COLUMBUS, OHIO
SEND FOR PRICES AND NAME OF NEAREST DISTRIBUTOR

Contractor Designs Special Repair Truck And Lubrication Shed

In order to speed the repairs of equipment on its many contracts operating in Rhode Island and Connecticut, M. A. Gammino Construction Co., of Providence, R. I., has developed a compact and efficient repair unit mounted on an International truck. The truck has a flat body on which is erected a large box with doors which may be raised for easy access to the interior of the box. In addition, beneath this box is space for one oxygen and one acetylene cylinder and a complete set of Prestoweld torches and tips. A special towing attachment is provided, so that the Lincoln arc welder may be taken along by the repair truck out into the field to make its repairs, without delay, on any piece of equipment.

Within the large storage box on the truck is a tool box of Snap-On wrenches, drills and dies, taps, calipers, feeler gages and small point wrenches, and sockets. There is also a full stock of gas-line tubing, an extra box of dies, a complete outfit of extra gaskets for the equipment on the job, spark plugs, radiator hose, welding rods, Alemite fittings, carburetors, and diesel pump parts, bolts and cap screws, clutch facings, ignition wire, fan belts, packing, and other miscellaneous items. There is also a sufficient number of crowbars and sledge hammers to carry out heavy work, a vise and grindstone mounted at the proper level on the side of the truck for easy service, and a heavy-duty Blackhawk hydraulic jack for lifting heavy equipment during repair. This truck was a part of the equipment at the M. A. Gammino Construction Co. contract on U.S. 44 at Abington Four Corners, Conn. (C. & E. M., Jan., 1942, page 2; Feb., page 19), during the 1941 construction season.

Another important factor in maintaining the equipment in good order was the storage and lubrication shed, a temporary shack built adjacent to the contractor's office. Here were stored six to ten barrels of Socony Vacuum lubricants of the various types required for shovels, tractors and trucks, for which the crankcase oil was changed every 60 hours. On Sunday all trucks were greased and checked throughout. All greasing was done with hand power guns, as this permitted the men to distribute the greasing over a larger area rather than being confined to the small area adjacent to an air compressor.

In the storehouse adjacent to the grease shed, enough steel cable was maintained on hand to provide a spare cable for each shovel on the job, as well as additional shovel teeth, brake



C. & E. M. Photo
A whole repair shop and parts department on one International truck—one of M. A. Gammino's service trucks out on the job.

bands and spare tires for the trucks.

On the contract where this equipment was in operation, J. F. Ableman was Superintendent, and Joseph Fiore was Master Mechanic for M. A. Gammino Construction Co., Providence, R. I.

Give to the USO War Fund today.

Otton Promoted at Robins

Alfred S. Otton of Robins Conveying Belt Co., Passaic, N. J., has been relieved of his former duties as Advertising Manager in order that he may handle important productive assignments in connection with the war work now being done by the company. In addition, Mr.

Otton will be responsible for both the sales and production in the Screen Cloth Department at Passaic.

John M. Lupton, formerly Assistant Advertising Manager, has been promoted to the position of Advertising Manager and will be responsible for all the functions of that Department.

Do your share in the fight for freedom.
Buy U. S. War Bonds regularly.

UNIVERSAL ARC WELDING ELECTRODES

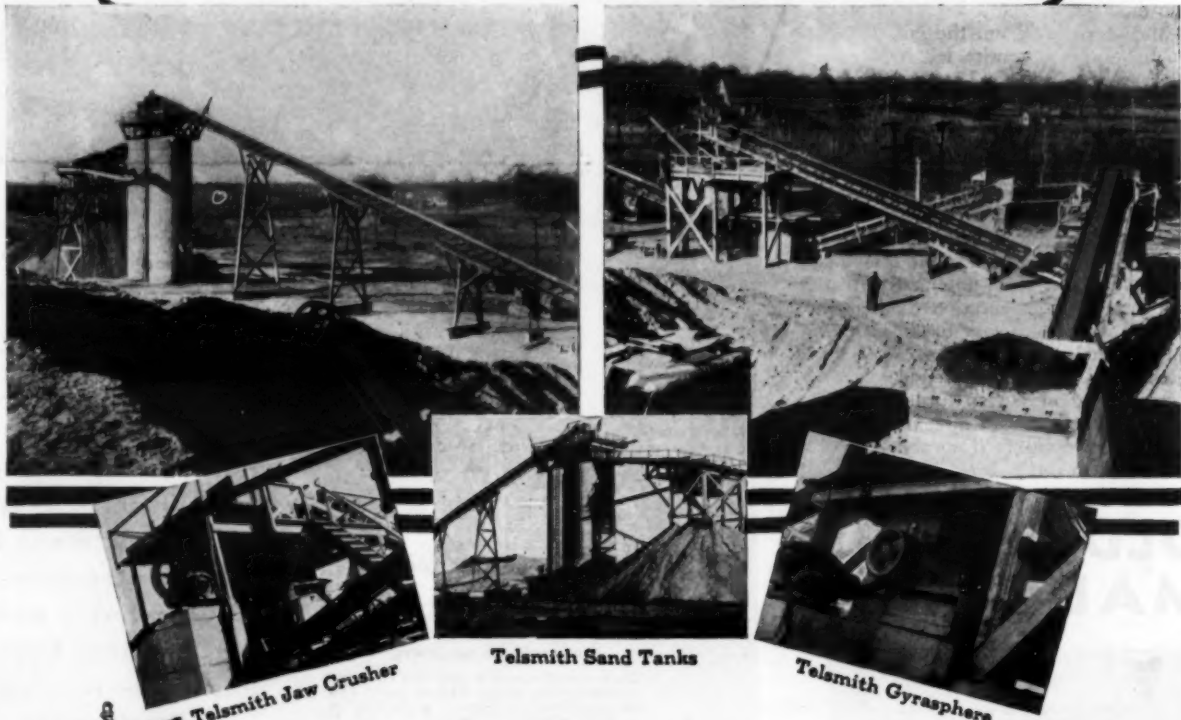
Steel, Bronze, Hard-facing
Prompt Delivery

UNIVERSAL POWER CORP.

4300-2 Euclid Ave., Cleveland, Ohio

TELSMITH Gravel Plant

goes all out
FOR WIN-THE-WAR CONSTRUCTION



Tel-smith Jaw Crusher

Tel-smith Sand Tanks

Tel-smith Gyrasphere

You Can't Have Too Many Simplex Jacks!

Don't get caught short! Use for Simplex Jacks on any construction job are practically limitless. You can't list the needs, for a new one is continually popping up—an operation you couldn't possibly perform without plenty of powerful, rugged, easily-operated jacks; and that means Simplex Jacks. Lifting, lowering, pushing, moving, supporting—they help you get the toughest jobs done quickly—safely—efficiently.

Three types—Lever, Screw and Hydraulic—available in a wide range of styles and capacities. Whatever the requirement, there's a Simplex Jack to do it.

Templeton, Kenly & Co.
Chicago, Ill.

Better, Safer Construction
Jacks Since 1899

Simplex Jacks

A better Jack for every job—
many jobs for every Jack



★ Minus and plus 3/4" and minus 1 1/2" gravel, and sand is in demand for war projects in the vicinity of Pawtucket, R. I. Starting operation Nov. 1, 1941, this new Tel-smith equipped gravel plant of J. J. McHale & Sons near Pawtucket is turning it out at about 125 to 150 tons per hr.

A 1 1/4 cu. yd. shovel and two end dump trucks feed raw bank run gravel into an 8 cu. yd. hopper having a railroad rail grizzly that rejects the few over-size boulders. A 30" x 5'6" Tel-smith Reciprocating Plate Feeder feeds material out of hopper and over a No. 450 Tel-smith Rotary Grizzly with 3/4" spaces. Plus 3/4" goes to an 18 x 30 Tel-smith Roller Bearing Jaw Crusher. A 30" x 73' belt conveyor takes minus 3/4" direct from the grizzly, and from the jaw crusher, to a 4' x 10' Tel-smith Single Deck Pulsator.

Plus 1 1/2" from this scalping screen goes into a No. 36 Tel-smith Gyrasphere Crusher; and when crushed returns to the 30" primary conveyor via an 18" x 48'6" conveyor.

Minus 1 1/2" from the scalping screen goes via a 24" x 186'6" finished product conveyor to a 5' x 12' Tel-smith 2-Deck Pulsator for washing and sizing. Sand is flumed to two No. 8 Tel-smith Sand Tanks on a tower independent of main plant. The two sizes of gravel are deposited in two 20' diam. concrete-block silo bins, fitted with bin gates for loading into trucks.

Why do so many operators with war construction jobs depend on Tel-smith? Because Tel-smith equipment can be pushed to top speed and will produce. Tel-smith Engineers' plant planning is sound. Tel-smith Service is fast. Get Bulletin G-34. G-10

SMITH ENGINEERING WORKS, 4014 N. HOLTON STREET, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York City	211 W. Wacker Drive Chicago, Ill.	713 Commercial Trust Bldg. Philadelphia, Pa.	19-21 Charles St. Cambridge, Mass.	Borchert-Ingersoll, Inc. St. Paul, Minnesota	Brandels M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqt. Corp. Charleston, W. Va.	Roanoke Trac. & Eqt. Co. Roanoke, Va.	North Carolina Eqt. Co. Raleigh and Stateville, N. C.	Wilson-Weemer-Wilkinson Co. Knoxville and Nashville, Tenn.	G. F. Seeley & Co. Toronto, Ont.	

Sand-Asphalt Base For Air-Field Roads

**Hardaway Contracting Co.
Used a Traveling Mixer for
Ellyson Field Streets at
Pensacola, Fla.**

THE character of the soil at Ellyson Field, one of the group of training centers for Naval Air Force personnel, near Pensacola, in Escambia County, Florida, is a natural well-graded sand with from 8 to 10 per cent clay. This was the determining factor in the decision to specify a mixed-in-place sand-asphalt for streets and roads at the field. The contract for street paving was awarded to Hardaway Contracting Co., of Columbus, Georgia.

Character of Streets

The mixing of the sand-asphalt for the street base was only a 25,000-square yard job, which was quite small compared to Hardaway's previous contract for 523,000 square yards of sand-asphalt paving for taxiways and runways. The street areas are very irregular, due to many parking areas near important buildings and short-radius curb returns. This made it impossible to use the traveling mixer really efficiently, and required overmixing in most of the areas. The integral concrete curbs and gutters had already been placed; and so, to protect them as well as the machine from damage, it was necessary to blade out the sand-clay from the gutters and also to loosen the entire width of road with a Caterpillar No. 12 power grader and its scarifier.

The Mixing Operation

A Wood Road Mixer pulled by a Caterpillar D8 was used for the road-mixing operations. Ordinarily, this mixer either pulls a large tank mounted on a trailer or has an auxiliary tank mounted above the mixer. This latter aids greatly in the effective operation of the machine, as it makes it easy to cut in hard soil. In this case, however, with the loose sand-clay, the extra weight was not necessary and the sharp turns made it impracticable to tow a trailer behind the already long combined mechanism of tractor and mixer.

OLD ROADS MADE NEW



The BURCH FORCE FEED SPREADER will lay a perfect stone mat with its specially designed cylinder which delivers the material uniformly and eliminates all tendency to corrugations.

A dual feed gate control allows instantaneous adjustment of the flow of material and also permits either end of the feed gate to be raised or lowered independent of the other. The machine is operated by the movement of the truck either forward or backward.

Manufactured by

THE BURCH CORPORATION
Crestline, Ohio

Builders of Equipment for 50 Years

For the work at Ellyson Field, a 2,000-gallon tank truck ran close beside the mixer, just about filling up the width of the streets which varied from 21 to 25 feet, not including parking areas. The asphalt was transferred from the tank truck to the pug mixer by a pump driven by a Ford V8 engine mounted on the back of the trailer-mixer. The average speed of the machine for effective mixing, with the extra-heavy windrows of additional material bladed in from parking areas and from close to the paved gutters, was only 10 to 12 feet per minute. The normal speed for mixing a standard windrow is about 19 feet forward motion per minute. An hydraulic lift on the control platform near the rear of the machine makes it possible to regulate the depth of the cut

and to prevent the gathering wings at the front of the machine from spilling extra material. Any lean streaks in the sand, caused by mixing the extra-large windrows, were remixed with the well-mixed material by a multiple-blade mixer pulled over the same section behind the Wood mixer.

The asphalt, an RC-1 with from 30 to 32 per cent naphtha, was mixed with the sand-clay at the rate of 2½ gallons per square yard of base 6 inches thick. The asphalt was hauled from the Mexican Petroleum terminal at Pensacola by a 3,000, a 2,000 and a 1,500-gallon tank truck. The operating personnel for the work consisted of the tractor operator, the mixer operator, and two laborers.

Surface Treatment

The machine-mixed base next received a double bituminous surface treatment. First, a tack coat of 0.25 gallon per square yard of an 85 to 100-penetration asphalt was applied, immediately followed by the spreading of 0.45 cubic feet per square yard of 1-inch down to

½-inch slag spread directly from the hauling trucks through the shortened tail-gates. This material was hand-spotted to insure uniform distribution over the road, and then rolled by a 7-ton tandem power roller. The rolling of the stone was followed with 0.35 gallon of the same asphalt, over which was spread 0.25 cubic foot of ¼ to ½-inch slag and rolled, completing the double surface treatment.

Personnel

The paving at Ellyson Field was done under the direction of Commander E. D. Graff (CEC) U.S.N., Public Works Officer of the Naval Air Base, Pensacola, Fla., with Lieutenant Robert E. Hookham (CEC) V (S) U.S.N.R., in charge of field work. The contract was completed by Hardaway Contracting Co., of Columbus, Ga., with John Money as General Superintendent, and Harry Taylor as Engineer in charge of paving for the contractor.

Free speech doesn't mean loose talk.

You can depend on Baker Hydraulic Bulldozers in the tight spots!

Baker's faster, more positive, direct lift and down-pressure is a natural for tight spots like this job—leveling around piers on a new War Department Building—Potts & Callahan, Contractors. That hair trigger action is just what is needed for most other grading, leveling, back-filling and earth moving jobs, whether in close quarters or out in the wide open spaces.

Baker's are helping Uncle Sam out of a "tight spot" by doing the bulldozing and grade-building with a minimum of fuss and maintenance on scores of war program jobs. War or peace, you can make the most of available horsepower with a Baker on your tractor front end.

The Baker Mfg. Co.
585 Stanford Ave., Springfield, Ill.

BAKER

The Modern Tractor Equipment Line for
**EARTH MOVING
LEVELING AND GRADE BUILDING**

1942 Catalog Describes Admixtures for Concrete

A feature of the 1942 catalog covering the products of The Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio, is a discussion of the principle of cement dispersion and the use of Pozzoloth, the cement dispersing compound for strong, durable and water-tight concrete. This compound, which is available in standard and high-early-strength types, is being used in a wide variety of concrete construction for war production, it is

reported.

Copies of this catalog, which also covers the other products of The Master Builders Co., may be secured by those interested direct from that company by mentioning this item.

Material-Handling Unit

Methods of cutting hauling costs on construction jobs, in quarries, on Army and Navy jobs, as well as in industrial plants, are illustrated and described with complete specifications in the newest

Dempster-Dumpster Catalog No. 2-42 released by Dempster Brothers, Inc., Knoxville, Tenn.

This catalog includes not only the well-known Dempster Dumpster unit but its modifications for special services, the Dempster-Dumpster extension boom, concrete buckets, auxiliary hopper stands for loading wheelbarrows and buggies with concrete, and special heavy-duty dump bodies for motor trucks. Copies of this catalog will be furnished free on request to those mentioning this review.

Penn Now a Novo Dealer

H. O. Penn Machinery Co., with offices at 140th St. and East River, New York City; Jericho Turnpike, Mineola, Long Island; and Pleasant Valley Road, Poughkeepsie, N.Y., has been appointed exclusive distributor for Novo equipment and parts in its territory. Penn handles the complete line of Novo self-priming centrifugal pumps, diaphragm pumps, pressure pumps, hoists, light plants, pavement breakers and power units.

PEAK PERFORMANCE PROTECTION

YOUR BLAW-KNOX DEALER WILL
HELP KEEP YOUR CONSTRUCTION
EQUIPMENT IN FIRST-CLASS SHAPE

BULK CEMENT PLANTS

CONCRETE SPREADERS & FINISHERS

TRUCK MIXERS

BINS AND BATCHERS

COAST TO COAST SERVICE

ALABAMA
Birmingham.....Young & Vann Supply Company
ARIZONA
Phoenix.....State Tractor Equipment Company
ARKANSAS
Little Rock.....Lyons Machinery Company
CALIFORNIA
Los Angeles.....Lafayette Machinery Company
Los Angeles.....K. M. O'Connell
San Francisco.....C. H. Grant Company
COLORADO
Denver.....Ray Curren Machinery Company
CONNECTICUT
New Haven.....The W. I. Clark Company
DISTRICT OF COLUMBIA
Washington.....Matt A. Deutsch Machinery Company
FLORIDA
Jacksonville.....Quinn R. Berton, Inc.
Miami.....Berry & Brown, Inc.
Miami.....East Coast Equipment Company, Inc.
Tampa.....Epperson & Company
GEORGIA
Atlanta.....W. C. Coyle & Company
IDAHO
Boise.....Intermountain Equipment Company
ILLINOIS
Chicago.....O. T. Christensen Company
INDIANA
Indianapolis.....Reid-Holcomb Company
IOWA
Des Moines.....Glicks-Babington Company
Des Moines.....Herman M. Brown Company
KENTUCKY
Louisville.....Brundage Machinery & Supply Company
LOUISIANA
New Orleans.....Southern States Equipment Company
MAINE
Portland.....Stanley & Cadogan Company
MARYLAND
Baltimore.....Henry H. Meyer Company, Inc.
MASSACHUSETTS
Boston.....The Equipment Company
MICHIGAN
Detroit.....Wm. P. Favorite Company
Grand Rapids.....Contractors Machinery Company
Iron Mountain.....Service & Supply Division
MINNESOTA
St. Paul.....Burchett-Ingersoll Company
MISSISSIPPI
Amory.....Dalrymple Equipment Company
MISSOURI
Kansas City.....G. W. Van Kappel Company
St. Louis.....C. B. Avery Company

MONTANA
Billings.....Western Construction Equipment Company
NEBRASKA
Omaha.....Anderson Equipment Company
NEW MEXICO
Albuquerque.....Power Equipment Company
NEW YORK
Albany.....Larkin Equipment Company
Buffalo.....Trevor Corporation
New York.....R. E. Brooks Company
NORTH CAROLINA
Raleigh.....Carolina Tractor & Equipment Company
Salem.....Carolina Tractor & Equipment Company
NORTH DAKOTA
Fargo.....Dakota Tractor & Equipment Company
OHIO
Cleveland.....H. B. Fuller Equipment Company
Columbus.....W. W. Williams Company
Cincinnati.....W. W. Williams Company
OKLAHOMA
Oklahoma City.....Leland Equipment Company
Tulsa.....Leland Equipment Company
OREGON
Portland.....Contractors Equipment Corporation
PENNSYLVANIA
Harrisburg.....Dravo-Doyle Company
Philadelphia.....Giles & Ramona
Pittsburgh.....Dravo-Doyle Company
SOUTH CAROLINA
Columbia.....Jeff Hunt Road Machinery Company
TENNESSEE
Chattanooga.....Hixon-Hassell Company
Knoxville.....Wilson-Woessner-Wilkinson Company
Nashville.....Wilson-Woessner-Wilkinson Company
TEXAS
Dallas.....Conley-Lott-Nichols Machinery Company
Houston.....R. B. Everett & Company
San Antonio.....Cochran Equipment Company
UTAH
Salt Lake City.....Lund Machinery Company
VERMONT
Barre.....Canfield-Venable Corporation
VIRGINIA
Roanoke.....Roanoke Tractor & Equipment Corporation
Richmond.....Roanoke Tractor & Equipment Corporation
WASHINGTON
Seattle.....L. A. Snow Company
Spokane.....Empire Equipment Company
WEST VIRGINIA
Charleston.....Charleston Tractor & Equipment Corporation
Charleston.....Charleston Tractor & Equipment Corporation
WISCONSIN
Milwaukee.....Hunter Tractor & Machinery Company

DON'T wait until your equipment
breaks down... have it inspected now
by your nearby Blaw-Knox dealer. His
technical ingenuity and wide experi-
ence will help assure you of constant
operating efficiency!

BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX COMPANY
Farmers Bank Building
PITTSBURGH, PA.

CONCRETE FINISHING MACHINES • CONCRETE SPREADERS • ROAD FORMS
BULK CEMENT PLANTS • TRUCK MIXERS • CENTRAL MIXING PLANTS •
CONCRETE BUCKETS • STEEL STREET FORMS • TRUCK TURNABLES

BINS & BATCHERS
CLAM-SHELL BUCKETS
TAMPING ROLLERS



Bureau of Reclamation Photo
Another milestone in the concrete placing at Shasta Dam.

The 3,000,000th Yard

The three-millionth cubic yard of concrete was placed in Shasta Dam on March 30, 1942, marking the half-way point in its construction. Ralph Lowry, Construction Engineer, reports that an outstanding concrete placement record has been made at Shasta Dam where the first concrete was poured on July 8, 1940, the one-millionth yard on May 3, 1941, and the second-millionth yard on October 12, 1941.

Although about 200,000 cubic yards of concrete are being placed each month, the 24-hour pouring record of 11,790 yards established on August 9, 1941, remains unchanged.

Sullivan Announces

West Coast Changes

The transfer of L. C. Rhodes to San Francisco and the broadening of the duties of Robert T. Banks have been announced by the Sullivan Machinery Co., Michigan City, Ind. Mr. Rhodes, who will take over the position of Manager of the San Francisco office, succeeding the late Perry W. Olliver, has been District Manager in the Spokane-Butte territory. This work will now be taken over by Robert T. Banks, who will continue to maintain his headquarters in Salt Lake City.

Portable Loader Booklet

The Athey MobilLoader is pictured and described in an interesting 12-page booklet recently released by the Athey Truss Wheel Co., 5631 West 65th St., Chicago, Ill. This booklet, entitled "The Athey MobilLoader" shows many applications of both the W4 and the Model

8 loaders, including general excavation, snow clearing, stockpile work, and handling gravel and crushed stone.

Copies of this booklet may be obtained by interested contractors and engineers by writing direct to the manufacturer and mentioning this item.

An Inner Tube Seal Protects Your Tires

The primary requisite for longer wear of rubber tires is proper inflation. Ever since the use of pneumatic tires on automotive and industrial equipment began, and now more than ever, there is need to use every precaution to eliminate improper inflation and the delays caused by flat tires. A puncture seal compound which is placed permanently in the tire and hence is on the job ready to seal slow leaks as well as punctures the moment they occur has been developed by Safety-ize Mfg. Co., 2814 Fullerton Ave., Chicago, Ill.

The use of Safety-ize compound is simple. The core of the valve stem is removed, the service pump is filled by suction, and the specified amount of the compound injected into the tube. Then the valve core is replaced and the tire is inflated to the recommended air pressure. Should a Safety-ized tire lose 4 or 5 pounds of air, it indicates that a nail or other puncturing object is embedded in the casing. This should be removed at once and then the wheel should be rotated to give the compound a chance to plug the hole.

Complete information will be furnished by the manufacturer to those mentioning CONTRACTORS AND ENGINEERS MONTHLY.

Data on Detachable Bits

A very complete discussion of detachable Jackbits, with more than fifty illustrations, a table showing the types of Jackbits recommended for different kinds of work, and various cost data are given in a new 24-page bulletin, "How Jackbits Reduce Rock Drilling Costs," recently issued by Ingersoll-Rand Co., 11 Broadway, New York City.

Free copies of this booklet, Form 2780, may be obtained direct from the company by referring to this item. Of particular interest in the book is the data on hard-rock jobs where detachable Jackbits and I-R reconditioning equipment have raised drilling speed while lowering both drilling and steel-handling expense.

A.E.D. Mid-Year Meeting

The twenty-third semi-annual meeting of the Associated Equipment Distributors will be held at the Edgewater Beach Hotel, Chicago, Ill., on June 8-10, in conjunction with Distributors Week. Sessions will be held on the three days,

with Wednesday afternoon given over to manufacturers group meetings. Arrangements for manufacturer-distributor conferences for the latter half of the week are being made.

A. E. D. members should make their hotel reservations through G. F. Lowe, 612 No. Michigan Ave., Chicago, Ill.

MIXERS
BATCHERS
PUMPS
SAW RIGS
HOISTS
CARTS
BARROWS
GET FREE CATALOG

DUAL PRIME

CENTRIFUGAL PUMPS

DOUBLE PRIMING ACTION!

FASTER, SURER PRIMING SAVES DELAYS—SPEEDS UP WORK.

1 1/2" to 10"

Big CMC Dual Prime on foundation well point job.

SATISFIED CONTRACTOR SAYS: "CMC Pump and Points handled entire job faster and better than any system previously used."

CONSTRUCTION MACHINERY CO.,
WATERLOO, IOWA

5 REASONS WHY PRODUCTION-MINDED MANUFACTURERS DEMAND I. B. BUCKETS

1. Deep, clean bites practically eliminate hand shovelling.

2. Fast opening and closing action speeds up production.

3. Extra sturdy yet light in weight. Large sheaves reduce rope wear and lower maintenance.

4. 50 years experience behind every I. B. bucket.

5. Standard sizes ready for immediate delivery.

INDUSTRIAL BROWNHOIST

DAY CITY, MICHIGAN • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO

ANY 4-YD. HIGH DISCHARGE TRUCK MIXER

GAR-BRO CONCRETE METHODS

High discharge truck mixers dump directly into this low-height, fully portable hopper. Double, grout-tight clamshell gates load twin lines of concrete carts or wheelbarrows. Trucks are freed as soon as they discharge. Ask for complete specifications!

Arnold Machinery Co., SALT LAKE CITY • Edward R. Bacon Co., SAN FRANCISCO • Conley-Lott-Nichols Machinery Co., DALLAS • Contractor's Equipment and Supply Co., ALBUQUERQUE • A. H. Cox & Co., SEATTLE • R. B. Everett & Co., HOUSTON • Intermountain Equipment Co., BOISE • Loggers and Contractors Machinery Co., PORTLAND • F. W. McCoy Co., DENVER

Manufactured and Sold by Garlinghouse Brothers, Los Angeles

Maintenance Schedule To Keep Trucks Rolling

(Continued from page 33)

Following schedule is performed:

REPEAT	1,500-mile period schedule and in addition the following:
CRANKCASE	Clean breather filter in gasoline, and oil.
OIL FILTER	Replace if can-type.
CYLINDERS	Tighten head stud nuts with tension wrench.
MANIFOLDS	Check and tighten nuts as required.
FUEL PUMP	Clean bowl. (Renew diaphragm at 30,000-mile periods.)
FAN BEARINGS	Add BB grease.
DISTRIBUTOR	Adjust breaker points. Check and set advance if necessary. Check wiring and report condition.
SPARK PLUGS	Clean and set gap.
GENERATOR	Check and set charging rate as required. Clean and tighten terminals.
STARTING MOTOR	Add 8-10 drops light engine oil. Clean and tighten terminals.
DRIVESHAFTS	Tighten universal joint flange bolts. Check tightness of hubs on shafts, and report.
SPRINGS	Tighten clip nuts. Inspect leaves and center bolt, and report.
BRAKES	Add 2 ounces special light oil (low-pour test) to vacuum power cylinder.
REAR AXLE	Tighten stud nuts holding differential to banjo. Tighten axle drive flange stud nuts.
REPORT	Any other items requiring attention.

18,000-Mile Service

After the above schedule, the 1,500-mile interval service is repeated until the next 6,000-mile period and is then repeated again until the 18,000-mile period, at which time the following schedule is fulfilled:

REPEAT	1,500-mile period schedule and 6,000-mile period schedule and in addition the following:
CRANKCASE	Remove pan, and clean pan and parts.
ENGINE	Inspect and tighten supports if necessary. Check and tighten bell housing screws as required.
VALVES	Check and adjust tappet clearance if necessary.
COMPRESSION	Check each cylinder and report.
CARBURETOR	Clean thoroughly and adjust as required. Check and adjust fuel level if necessary.
COOLING SYSTEM	Flush, and inspect hose and report. Drain cylinder block as well.
DRIVESHAFTS	Check and tighten center bearing lock nuts and frame bolts.
STEERING	Check gear and take up excess back-lash, if any.
WHEELS	Check and set toe-in if required. Remove wheels, and clean bearings. Repack bearings with short-fibre wheel-bearing grease and adjust for proper end-play.
BRAKES	Wash vacuum power cylinder air cleaner in kerosene, and oil. Wash vacuum external valve air filter in gasoline, and oil.
REAR AXLE	Check end-play in pinion bearing and report. Check for excess back lash and report.
REPORT	Any other items requiring attention.

Repeat Faithfully

After the above schedule has been performed, the entire cycle repeats itself. It is claimed that in actual practice this "Preventive Maintenance Plan" has on numerous occasions proved itself one of the surest ways of detecting minor troubles, which if left unattended would

have resulted in breakdowns on the road with all the attendant expense and inconvenience.

Properly maintained, your present trucks will render many additional thousands of miles of uninterrupted service. Today it is not only good business to conserve your truck equipment through periodic inspection, but it is also good patriotism. For, each in its own way, every truck on the road today is doing its bit in America's drive for ultimate victory.

Peerless Pump Division Acquires Sterling Pump

The Sterling Pump Corp. of Hamilton, Ohio, and Stockton, Calif., has been acquired by the Peerless Pump Division, Food Machinery Corp. of Los Angeles, Calif., and Canton, Ohio. Peerless will consolidate the Sterling plant at Hamilton with the new Peerless manufacturing plant at Canton, Ohio, and Sterling's Stockton plant will be merged with the

John Bean Mfg. Co., Division of the Food Machinery Corp., at San Jose, Calif.

Vernon Edler, Vice President and General Manager of the Peerless Pump Division, reports that consolidation of the two manufacturing plants will greatly expedite handling the tremendously expanded volume of pumps on order at both concerns. The line of deep-well turbine pumps, jet pumps and small domestic pumps, manufactured by Sterling for the past 25 years, will fit into and complement the complete line of Peerless deep-well turbine pumps, Hi-Lift pumps, and Hydro-Foil propeller-type pumps.

Personnel affected by the purchase of Sterling by Peerless Pump is as follows: H. J. McKenzie, President of Sterling Pump Corp., joins the Peerless Pump Division as Assistant to Mr. Edler; Frank Jones, Manager of Sterling's New York Office, will continue with Peerless; John Mikesell, formerly engineer for Sterling, will assume the position of

Manager of the Sterling and small products line; Jack Wade, Sterling's Chief Engineer, will be in charge of the new developments at the Canton plant; other employees of Sterling will be retained in the Peerless organization.

TO CONTRACTORS Working On Victory Jobs



HERE'S HELP on equipment maintenance & service problems

Make your LeTourneau "Caterpillar" dealer your victory construction headquarters for the duration. He's well equipped with time-saving parts and service facilities to economically recondition your present equipment to practically new working efficiency... and to put your old irreplaceable tractor rigs back to work. You'll save valuable machine hours. Here's how:

CHECK YOUR NEEDS ✓

FACTORY-MADE PARTS are quickly available through dealer stocks of genuine LeTourneau Scraper blades, Dozer blades and tips, Rooter shanks and shoes, etc.

TOURNAROPES, made especially for LeTourneau cable-operated, tractor-drawn equipment, can be had in eight sizes: $\frac{3}{8}$ ", $\frac{1}{2}$ ", $9/16$ ", $5/8$ ", $3/4$ ", $7/8$ ", 1" and $1\frac{1}{4}$ ". Ideal for replacement use on LeTourneau equipment.

TOURNAWELDS are made expressly for the various welding applications used in manufacture of LeTourneau equipment. Now you can get it in 6 types and many sizes for making stout welds quickly in the field for replacement and repairing LeTourneau equipment.

PROPER BEARINGS—LeTourneau selected and approved bearings for all LeTourneau units.

EXPERT SERVICE—Your LeTourneau "Caterpillar" dealer has a corps of factory-trained servicemen, welders and skilled mechanics, ready to check and repair your equipment for you.

SHOP & FIELD FACILITIES—Many LeTourneau dealers are equipped with portable welding outfits and track pin presses to give you fast field service. All have adequate shop facilities.

PROPER JOB PLANNING insures getting maximum yardage from your equipment. Your LeTourneau dealer will give you factual field engineering figures on possible yardage increases and will show you how through time-saving operating hints.



CALL YOUR DEALER . . .

Make use of this check list to determine your equipment needs, then call in your local LeTourneau "Caterpillar" dealer . . . TODAY . . . and any day you have equipment maintenance and overhaul problems. Keep your equipment working every minute for victory!

LETOURNEAU

CONTINENTAL BULLETIN



RE-VITALIZED RUBBER MAINTAINS QUALITY

Continental chemists and engineers have perfected the production of Re-Vitalized Rubber to the point where, in most cases, it will fully meet your requirements. Whether it is Hose, Packing or other Mechanical Rubber Goods, every time you specify Re-Vitalized Rubber, crude rubber is conserved for war orders.

Let the Hand of the Specialist aid you in re-designing your rubber products so that Re-Vitalized Rubber may be used in filling your specifications. Meet eventualities now. Rubber is Ammunition. Don't waste it.

From Factory Bulletin Board of the
CONTINENTAL RUBBER WORKS
MEMBERS OF THE VITALLIC LINE SINCE 1901
ERIE, PA., U.S.A.



An ARMY "Travels on its Stomach"

EXPERIENCE BUILDS 'EM
PERFORMANCE SELLS 'EM

**ROGERS
HEAVY DUTY
TRAILERS**

**LEND a HAND
on the
HEAVY EQUIPMENT**

ROGERS BROTHERS CORP.
108 Orchard St.,
Albion, Pa.



Night repairs and adjustments speeded by portable carbide lights.

Portable Floodlights Speeding Night Work

A new line of portable floodlights, to aid in maintaining night shifts on construction jobs without the delay and expense of installing permanent lighting, has been announced by National Carbide Corp., 60 E. 42nd St., New York City.

The new NC-200 model, shown in the illustration, which is the largest unit now being made, has two 8,000-candle-power floodlights constructed on swing joints, thereby allowing independent directional control with 16,000-candle-power concentration of light. These portable floodlights may be used continuously or intermittently, and are always ready for instant use until the carbide charge is exhausted. They are used extensively for construction and repair work, for routine railroad checking jobs, and for emergency services.

Additional information, literature and prices may be obtained by writing to National Carbide and mentioning this item.

How Bulldozers Are Made

The latest bulldozer broadside from R. G. LeTourneau, Inc., Peoria, Ill., explains the main construction features of the LeTourneau Dozer and shows it in operation on various types of jobs and under various working conditions. Detailed illustrations show exactly how the

four types of Dozers are made and the text gives condensed specifications on each model.

Copies of Form A-278 can be obtained by writing to LeTourneau at Peoria and referring to this item.

Truck Dealers Aid In Selection of Tires

The wartime restrictions on the sale of both motor vehicles and tires present problems to truck operators that may be even more serious than those confronting passenger-car owners. The truck-tire situation is becoming increasingly acute for many reasons, according to B. B. Settle, Director of Service, Dodge Division, Chrysler Corp., Detroit, Mich. The urgent need for swift transportation of munitions and all war materials increases the tendency among truck operators to overload their vehicles. Overloads cause excessive tire wear and premature failure unless truck tires are of the right size and type to stand up under the added strain of overload operation.

The recent action of tire manufacturers to standardize truck-tire sizes in order to conserve the rubber supply further complicates the truck-tire preservation problem. Combination of balloon and high-pressure tires and, in some cases, the elimination of high-pressure types, has halved the former tire size range. Through an extension of the Dodge Job-Rated truck program, Dodge dealers have been given special instructions in the proper application of tires to meet these new conditions. They are now in a position to counsel the operators of all makes of trucks and to recommend types and sizes of tires that will give maximum service.

Gravel Crushing Plants

The most recent illustrated catalog of Gruendler Crusher & Pulverizer Co., 2915-19 N. Market St., St. Louis, Mo., gives complete details and dimensions of Gruendler all-steel roller-bearing jaw crushers, portable jaw crushers, portable straight-line crushing and screening plants, portable stabilizing plants and complete rock crushing and screening plants with roll crushers and pulverizers as well as vibrating double-deck screens and revolving screens.

Copies of this Catalog 601 may be secured free by writing direct to the manufacturer.

1942 Model 34-E Paver

The Rex 34-E paver for 1942 is a two-compartment paver with a capacity of 34 cubic feet of concrete. Incorporated in the operation of this paver is the Rex mechanical man which controls charging, discharging and mixing operations automatically. The 1942 paver

has a new low overall height, extended crawlers and a roomy clear-vision operating platform. The engine is mounted away from the skip to minimize the dust and dirt.

Bulletin 407 just issued by Chain Belt Co., 1666 W. Bruce St., Milwaukee, Wis., describing the new 34-E paver may be secured from the manufacturer.

"TOOLS OF WAR COME FIRST!!"



Any other use of steel presents a challenge to every producer, designer, and user.

IN CONSTRUCTION ALONE, many THOUSANDS OF TONS of steel can be converted to vital armament through ADVANCED DESIGN and CONSTRUCTION ECONOMY to eliminate waste.

This is one of a series of recommendations for WEIGHT SAVING DESIGN to conserve wartime steel and production.

FOR EFFICIENT CONCRETE CONSTRUCTION SPECIFY:

- SHOP ROLLED SPIRALS AND COLUMN TIES
Shop fabricated spirals are accurate, provided with substantial spacers, and handle easily.
- PERMIT OPTIONAL USE OF RAIL STEEL OR HARD GRADE BILLET STEEL.
- PREFABRICATED BAR SPACERS AND SUPPORTS
Welded high chairs, bar spacers, and supports save many man-hours in the field.
- WELDED STIRRUPS FOR BEAM REINFORCEMENT
Accurate shop welded and assembled stirrups minimize steel placing costs and permit greater construction speed.
- WIRE MESH REINFORCEMENT
Wire mesh with advantages of high tensile strength, good bond, and mechanical anchorage in concrete is most efficient slab and temperature reinforcement.

LACLEDE STEEL COMPANY
ST. LOUIS MISSOURI

Design Series No. 3



Saved \$1150.00

HARD-FACING SHEEPSFOOT TAMPERS WITH STOODY SELF-HARDENING

Here is a typical example of how replacement problems and equipment tie-ups are eliminated with Stoody Hard-Facing Alloys...

A contractor was compelled to replace the tamps on his sheepfoot rollers every few days. Since new tamps cost 60c each and there were 560 tamps per unit, replacement expenses mounted rapidly.

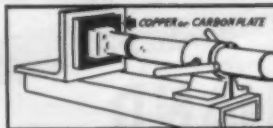
A maintenance welder suggested rebuilding worn tamps with Stoody High Carbon and hard-facing wearing surfaces with Coated Stoody Self-Hardening. Rebuilding cost, including time, material, and power, was only 50c each—tamps thus reclaimed gave service equal to four sets of unprotected tamps!

To hard-face replaceable tamps construct a jig as shown. Place end of tamp against copper form and rebuild it to size with Stoody High Carbon. Then turn tamp on end and protect sides and ends with a single pass of Coated Stoody Self-Hardening.

Stationary tamps should be hard-faced before being placed in service and re-hard-faced as soon as original deposit wears away. One rod of 3/16" Coated Stoody Self-Hardening provides ample protection for a 2" x 3" tamp.

The Stoody booklet "Procedures for Rebuilding and Hard-Facing Contractors Equipment" lists and explains many profitable hard-facing applications on construction equipment. Write for your copy today!

Stoody Company • 1134 W. Slauson Ave. • Whittier, Calif.



STOODY COMPANY

Hard Facing Alloys



Avoid Legal Pitfalls

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Edited by A. L. H. STREET, Attorney-at-Law.

"Road Under Construction"

When a motorist enters a stretch of road, after being warned by a barricade, notice or otherwise, that the road is undergoing repair or construction, he must be on a constant lookout for obstructions. It is not necessary that the contractor give the same intimate warnings concerning each obstruction that would be necessary on an open and completed highway. So ruled the Nebraska Supreme Court in the case of *Miller v. Abel Construction Co.*, 300 N. W. 405, where a motorist collided with a road roller in the dark immediately after passing another car. There was a red light burning on the roller, although plaintiff claimed that he did not see it. Said the court:

"While plaintiff complains that the roller was without reflectors, the record is silent as to the type, color or size that should have been used. It seems reasonable to presume that, inasmuch as plaintiff's husband did not see the red lantern on the roller, he would not have seen a reflector, a less effective signal. Nor is the want of flares evidence of the lack of due care. A definite portion of the highway was under construction and barricaded off and closed to the general public by appropriate signs and signals. The plaintiff and her husband had actual knowledge that the highway was under construction, having passed over it several times previous to the accident, and the highway itself on the evening of the accident showed it was under various stages of completion. Due care did not require that the defendant place flares at intermediate points during the progress of the work."

Contracts Silent as to Pay

Here is one for the Quiz Kids: A subcontractor agreed to clear a dam construction site of stumps, etc. But the contract did not say whether he was to be paid for the work or not, and, if so, how much. Having done the work, what were his rights as to pay?

The United States Circuit Court of Appeals, Ninth Circuit, than which there is no tribunal more infallible excepting the United States Supreme Court, followed two rules that lawyers learn in the "first grade". (Barnard-Curtiss Co. v. Maehl, 117 Fed. 2d, 7.)

The first rule is that when one person does work for another—outside of things that we do for our grandmothers and other close kinspeople—it is supposed that the job is to be paid for. The contractor is not supposed to be doing a Boy Scout's good deed for the day, nor muscling in on Santa Claus's preserves.

The second rule is that where it appears that a job was done in expectation that it would be paid for, but nothing was said about how much, old man Law steps in as referee, and fixes the reasonable value of the work as the amount to be paid. It may take a flock

of lawyers and a lawsuit trailing through two or three courts to settle the question of what is "reasonable value" in the particular case.

Reasonable value is the actual and reasonable cost of doing the job, plus a reasonable profit. Thus it will be seen that two questions can grow out of one. The moral of all of which is, of course, that every contract ought to specify how much the contractor is to get for his toil.

"Responsible Bidders"

That the word "responsible" in the term "lowest responsible bidder" is to be given substantial effect has often been recognized by the courts. One may be low in dependability as a contractor as well as lowest in price. This does not mean that fine distinctions are to be drawn between bidders who drink beverages stronger than water and those who are abstemious, nor between those who go to church and those who do not. But it does mean that those charged with acceptance of bids are entitled to use reasonable discretion in determining who is the "lowest responsible bidder."

In the case of *Picone v. City of New York*, 29 N. Y. Supp. 2d, 539, complaint was made against the award of a sewer contract to the second lowest bidder. The Supreme Court for New York County said: "The term does not mean one who is only pecuniarily responsible but one who possesses moral worth. * * * It implies skill, judgment, and integrity as well as sufficient financial resources."

The court also declared that the determination as to who is the lowest responsible bidder is in the nature of a judicial function, and that an official or board, in awarding a contract to a bidder not the lowest in price, will be presumed to have acted honestly and in the public interest, unless the contrary be proved.

Suing Public Officials

Neither a state nor the United States can be sued unless it has consented to the suit. The same exemption is held by the courts to apply to officials while acting within the scope of their official authority. But an official renders himself amenable to suit when he commits a wrongful act outside of his powers. For example, in a Minnesota case a state highway commissioner was held liable in damages for causing material excavated from a highway to be dumped upon private land, when no right to place the material there had been acquired.

Another example, showing when an official may be sued, is afforded by the decision of the United States Circuit Court of Appeals, Eighth Circuit, in the case of *Noce v. Edward E. Morgan Co.*, 106 Fed. 2d, 746. There a government engineer was enjoined from treating as an unconditional bid on a job a pro-

posal that was conditional. The court decided that the engineer "was acting unlawfully and outside of any authority conferred upon him. A suit to enjoin the defendant from doing that which the law authorized him to do would be, in effect, a suit against the United States. A suit to enjoin him from doing a thing which was unlawful and unauthorized would not be a suit against the United States, but a suit against the defendant as an individual, and it would be unnecessary to enjoin any other party."

Buy U. S. War Bonds and Stamps.

New District Manager

S. L. Bates has been appointed Buffalo District Sales Manager for Wickwire Spencer Steel Co. of New York City. Mr. Bates joined Wickwire in 1936 and has been in the Ohio territory since that time. Since 1918 Mr. Bates has been associated directly and indirectly with the steel industry. He will be located in Wickwire Spencer's Buffalo, N. Y., offices in the Rand Building.



HAISS Hi-power
FOR PAY-LOAD
CLAMSHELL DIGGING

ALL SIZES AVAILABLE

Your good crane deserves one! Real he-man digging power and a hefty sturdiness that will stand up to your toughest goings... a Hais Hi-Power will make money for the man who owns it. Catalog on request.

HAISS QUALITY EQUIPMENT FOR 50 YEARS 1892-1942

In stock at New York, Philadelphia, Baltimore, Atlanta, Hartford, Richmond, Charlotte and Los Angeles

GEORGE HAISS MFG. CO., INC., Canal Place & East 142nd St., NEW YORK

DISTRIBUTORS EVERYWHERE

ENLISTED
EARLY for
WAR SERVICE
.. STILL IN

Grader	No. 101		No. 201	
	Gasoline 64	Diesel 88 1/2	Gasoline 46	Diesel 50
Motor H. P.				
Weight* single drive			15,100	15,600
double drive	19,800	20,800	17,400	17,900
Length	26'2"	25'2"	25'2"	25'2"
Blade length	12'	12'	12'	12'
Frame weight per ft. lbs.	92	92	84	84
Reversible blade	Yes	Yes	Yes	Yes
Frame type	Box	Box	Box	Box
Bulletin	No. 253		No. 254	

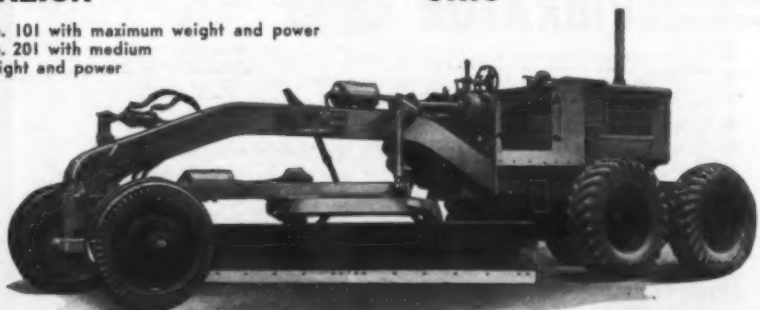
*Less scarifier.

In the present crisis we had to have more cantonments, airports, and access roads to Victory plants, navy yards . . and had to have them right promptly. A major step toward this goal was the selection of Galion road machinery to speed the construction work. Motor graders and rollers . . worthy tools for the men behind the men behind the guns. Galion is still in the service . . is proving quite an ally in our all-out effort for VICTORY.

THE GALION IRON WORKS & MFG. CO.

GALION - - - - - OHIO

No. 101 with maximum weight and power
No. 201 with medium weight and power




get TO the job
FAST...
get THRU the job
FAST...

—with the Model 60
LEROI
Portable Air Compressor

Here's a toughie that can take the punishment of today's fast working schedules. It has "the stuff" to lick 'em: Speed in set-up and starting. Speed and economy in operation. Speed and safety in moving. A 60 cu. ft. single-stage unit with both valve-in-head engine and compressor built by one manufacturer. Light in weight. Low in price. Operates two tampers or one paving breaker of average size, or other tools requiring similar quantities of air.

Get Le Roi's Model 60 for your next job. C-8

*Write for Bulletin 11G-1 for facts about the Model 60's "big compressor" features.

Handling Materials For Large Dry Dock

(Continued from page 13)

machines naturally causes wear on the valves. They are reversed to take up initial wear and then serviced by depositing hard Fleetweld rods on the worn section by arc welding, and machining the deposit to a true face.

The concrete plant is located on the north side of the area at about the middle of the operation. The five 8-inch Pumpcrete pipes run to the edge of the dry-dock operation and then, depending on the location of the tremie barge, turn left or right with 90-degree bends. At the point opposite where the tremie barge is operating, another 90-degree bend carries the pipes out onto the bridge barge. At this point the pipes are anchored to a deadman buried in the dirt. On the bridge barge the pipes have ball and socket connections with the shore and another set where the pipes are connected to the tremie barge to take care of the rise and fall of the tide, inequalities in loading, and in the relative elevations of the bridge and tremie barges. The pipes rise from the bridge barge at an angle of about 60 degrees with the horizontal to a height of about 60 feet at the top of the tremie barge trestle.

Tremie Concreting

The tremie barge, a 265 x 35-foot wood scow, carries the tremie trestle, seven 3-drum steam hoists, a 150-hp steam boiler, a 100-cubic foot Chicago Pneumatic air compressor to furnish air for divers, and rest quarters for the six divers working from this barge. In order to keep the barge on an even keel, 6-foot cubes of concrete are mounted on the side opposite the tremies as counterweights.

At the top of the tremie trestle are five control houses into and through which the Pumpcrete pipes run. These are so arranged that two pipes can discharge into the hopper in any one of the tremie control houses. Concrete from the hopper in a control house is delivered through an elephant-trunk chute to the single hopper of a battery of three tremie pipes where the concrete may be directed to any one of the three tremies.

Five of the 3-drum steam hoists, each with its separate operator, raise and lower the five groups of three tremie pipes, each of which is 70 feet long and 12 inches inside diameter. There is a foreman in charge of each working group comprised of a control house, distributing chutes to three tremies and a hoist. Two hoists handle the mooring lines at the end of the barge.

Prior to starting a tremie pour, a special flat wooden disk with four steel centering prongs or guides is hung in the pipe. This disk has a canvas cover which spreads out and holds back the concrete. The disk is lowered in the pipe as the concrete is admitted above and when the disk reaches the bottom, the concrete flows out and the discharge is maintained with the pipe full at all times, discharging from 3 to 5 feet below the surface level of the accumulated concrete so that little of the concrete actually comes in contact with the salt water in which it is being poured. As it is essential to know at all times the relative elevations of the bottom of the tremie pipe and the surface of the poured concrete within the form, check measurements are made from the barge supplemented by diver inspection below.

Safety Features

To insure the maximum safety on this Navy Project, great care has been taken by all parties to prevent fire and accidents. Carbon tetrachloride, foam-type and acid and soda fire extinguishers are distributed generously throughout all buildings, the type of extinguisher being selected for the character of fire which might develop at any particular location. Water mains and hydrants are installed throughout the plant area with fire hose at critical locations.

No ladders are used as access to parts of operating buildings, but substantial 8 x 10-inch stairs with smooth handrails are built for the use of workmen and inspectors throughout the project. All stairways have metal non-skid treads screwed to the wooden treads and at the top of each stairway, or at a landing, the metal plate is inset flush with the platform for additional safety.

Hand-rail barriers are placed along the edges of all conveyor belts and all gears are covered with woven-wire guards or sheet metal casings. Workmen are cautioned continuously to wear tight-fitting coveralls when working around machinery. Safety hints to the

individual workmen are publicized by bulletin board displays at prominent locations throughout the job through the cooperation of the insurance carrier and the National Safety Council.

A fully staffed clinic is maintained by the contractor 24 hours a day and, in association with the building contractors at the site, an ambulance is maintained to carry injured workmen, on order of the physician or nurse in attendance at the clinic, to the designated hospitals which care for emergency cases.

Personnel

This Naval dry dock is being constructed on the North Atlantic coast under the direction of the Bureau of Yards and Docks, U. S. Navy, of which Rear Admiral Ben Moreell, (CEC), U.S.N., is Chief, with Commander A. D. Alexis, (CEC), U.S.N., as Officer in Charge of Construction. George H. Flynn Corp. and Great Lakes Dredge & Dock Co. are associated as the contractors, for whom Herbert M. Hale is Manager. The operation of the plant described is

in charge of S. Davis, Concrete Superintendent, under the direction of Cornelius Vermont, General Superintendent for the contractors.

WON'T QUIT or cause time out



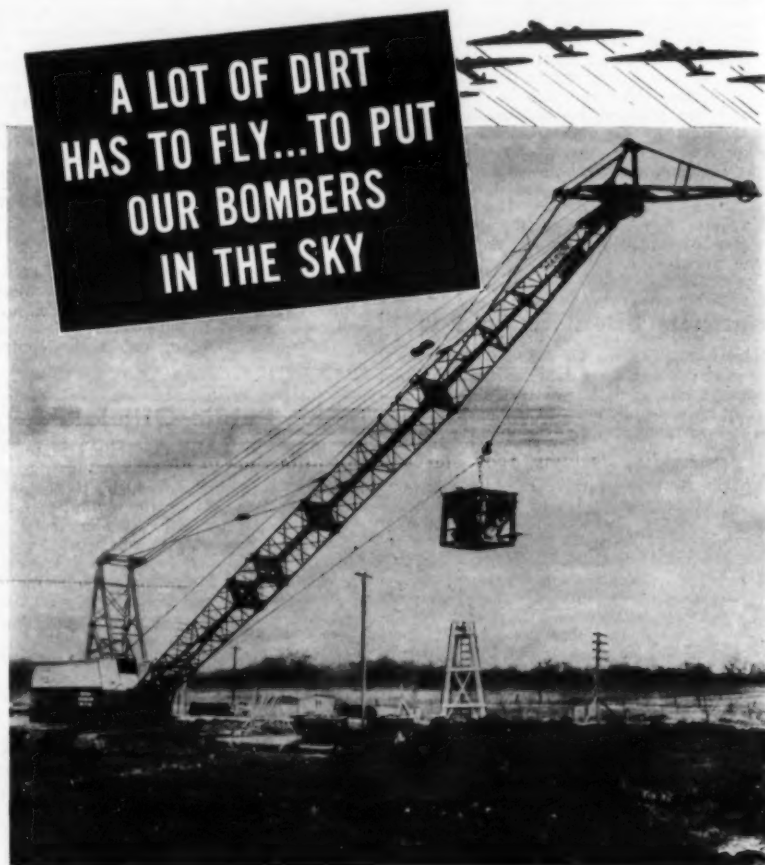
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company

32-36 Day Street
New York, N.Y.

Hayward Buckets

A LOT OF DIRT
HAS TO FLY...TO PUT
OUR BOMBERS
IN THE SKY



★ Where is this? What are they building—a new bomber plant? A big one? What type of bombers? Who's going to make 'em? How fast can they turn 'em out . . .

That's your Uncle Sam's business! And his nephews aren't loose-lipped these days.

Being Uncle Sam's business, the contractors (mentioning no names, except to say they're smart operators) didn't lose any time on the job . . .

There's nothing secret about this. The way to get a war construction job done right-on-schedule or ahead of time is to use Waukesha-Engine-powered equipment. That's what happened here—with this Marion Type 40-A Crane and its Model 6NKH 6-cyl., 7 x 8½ in., 1962 cu. in. displacement Waukesha-Hesselman Oil Engine.

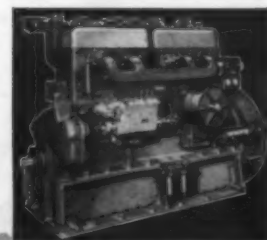
The Hesselman starts as easily and quickly as a gasoline engine . . . burns high speed diesel fuels and domestic furnace oils 1, 2 or 3 smoothly. Its compression pressures are low; its electric ignition positive, and definitely timed. Its explosion pressures actually are less than compression pressures in a Diesel. This means that the strain on rods, heads, pistons, cylinders, gaskets and bearings is less.

Waukesha Engines stand up under round-the-clock seven-day-week operation. And still turn out full rated horsepower—with reserve power for the pinches.

For Industrial, Stationary, and Automotive Power—Waukesha Oil and Gasoline Engines range in size from 5 hp. to over 300 hp. Get Bulletins 1079 and 1200.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

★ ★
MORE
POWER



FOR
VICTORY
★ ★

WAUKESHA ENGINES



**Make EVERY
Minute • Man
and Material
COUNT
for DEFENSE**

with A *Mall*



3 H.P.

GASOLINE POWERED VIBRATOR

- Places low-water-cement-ratio concrete faster, better
- Eliminates honeycombs, voids and expensive hand patching
- Assures a stronger bond with reinforcement
- Permits an earlier stripping of forms
- Variable speed engine runs all day on 1½ to 2 gallons of gasoline
- Operates 8 other interchangeable tools for Concrete Rubbing, Grinding, Sanding, Wire Brushing, Drilling, Pumping, Sharpening Tools and Bits and Sawing with Chain or Circular Saw

Write AT ONCE for full details and ask for a FREE Demonstration

MALL TOOL COMPANY
7743 SOUTH CHICAGO AVE. CHICAGO, ILL.
Offices and Distributors in Principal Cities

We Make Over

200

Gasoline Engine
Air and Electrically
Operated Portable
Power Tools and
Attachments



C. & E. M. Photo
Shop Foreman F. Hagen works on an engine in the well-equipped Valley City District Garage of the North Dakota State Highway Department.

Repair and Storage Of State Equipment

(Continued from page 22)

black and with the tools mounted on it, outlined in yellow, for holding special tools.

On the second bench is mounted another Black & Decker drill press, a series of metal bins for all sizes of cotter pins, a special mounting board for wrenches and die cutters, and two vises on the bench. Adjacent are a buffer and grinder on a floor stand, a blacksmith's forge and anvil, and a large wooden rack of bins for bolts.

At the back of the garage is an Oxweld portable acetylene welding outfit, a steel rack for holding welding rods and a heavier rack for blacksmith steel. A Weaver Hi-Speed press, a steel welding table, and a J. D. Adams arc welder mounted on four pneumatic tires complete the equipment at the back of the garage. This arc welder is readily moved about the garage and may be towed out to do a field job of repairing if necessary. Adjacent to the arc welder is a double tray mounted on casters so that it can be pushed readily between two trucks to hold nuts and bolts and keep them from being kicked around. A new Ingersoll-Rand garage compressor has

recently been purchased to give greater pressure for spray painting and is installed in the Paint Shop.

Storage and Sign Sheds

About 150 feet west of the repair garage is a 42 x 164-foot storage shed. At the north end is a wash rack for equipment and a winding stand for repairing rotary brooms used to clean roads before the Maintenance Department reseals them. This section of the storage garage has a concrete floor and drain while the balance, which provides storage for about six trucks, has a gravel floor and is entered by two large overhead doors similar to the ones leading to the wash rack. An extension has been made to the storage shed for additional trucks, entered by a separate large overhead door.

North of the storage shed is a 40 x 60-foot sign shed equipped with large racks for the storage of signs, and bins for used signs which are to be cleaned and repainted before again being placed out on the roads.

Outside Storage

In order to take care of the large amount of material and excessively large equipment there is a very large storage yard to the south and west of the repair garage. Here snow plows, snow fence, culvert pipe, and worn-out equipment are stored. Among the larger pieces of equipment at the Valley City Garage are a Snogo which is used for widening out the roads late in the season and a Walter truck which is used with a large V plow for initial opening of the roads.

The Division has a Cleaver booster heater for asphalt tank cars which is also used very effectively in spring for thawing culverts. Inasmuch as this latter work requires a large amount of water, the Cleaver tank-car heater is towed behind a truck on which is mounted a 500-gallon tank of water.

Other Garages in District 2

In addition to the repair garage and storage facilities at Valley City, there is a shop for repair work located at Fargo and six storage garages south of Valley City and four storage garages north.

Personnel

M. P. Wynkoop is Division Engineer for District 2 of the North Dakota State Highway Department with its offices at Valley City; W. A. Wise is Assistant Division Engineer; Dan. E. Smith, Division

Maintenance Engineer at Valley City; and Charles P. Kimball, District Maintenance Engineer at Fargo. Z. E. Severson is State Highway Engineer for North Dakota.

Our War and Wire Rope

You can journey swiftly around the great circle of our war effort without leaving your chair if you have a copy of "National Defense and Yellow Strand Wire Rope—Their Relation to Each Other and to You." This catalog of

Broderick & Bascom Rope Co., St. Louis, Mo., has illustrated chapters devoted to steel, power and fuel, construction, transportation, and weapons, each with pertinent information as to the part wire rope is playing in that particular field. The concluding chapters discuss priorities, allocations and deliveries and how they work together to place wire rope where defense and war-effort needs are most urgent.

A copy of this catalog may be had for the asking if you will mention this review.

**250 LINEAR FT. per HOUR
of 25 FT. SLAB (MINUS 1" SLUMP)
9'-5"-9" THICK**



with this JAEGER *Screw* SPREADER



and this JAEGER *Type 'H'* FINISHER

Ferry & Pearson Laid Up to 135 Cu. Yds. an Hour,
AVERAGED OVER 120 Cu. Yds. an Hour, Day
after Day, on Muroc Bomber Range, California

Record-Breaking Production of Denser, Smoother Slab—Fewer Men

On U. S. airport, near Ft. Wayne, James A. McKay & Sons report Jaeger Spreader-Finisher team was absolutely necessary to handle the very dry concrete in 25' width.

On 86 miles of 20'-24' slab, Koss Constr. Co. used 4 Screw Spreaders, report all engineers highly pleased.

On Ford's Willow Run Bomber Plant, 4 Jaeger Finishers placed 63 miles of 20' slab in 42 days.

On Higley Airport, Jaeger Team placed 362' per hour of 1 1/2" slump concrete 12'6" wide without labor in front of machines and no trace of segregation.

Saved 3 to 5 men behind 34E dual paver, reports C. H. Atkinson Paving Co., Missouri.

On Pennsylvania Turnpike Adam Eidemiller did 5160' in 14 hours, Tri-State Engr. averaged 4000 sq. yds. daily on 167,000 sq. yd. contract.

Spreader, equipped to both spread and finish, laid up to 150 tons hourly of bituminous resurfacing for Barber Construction Co., Chicago.

Ask Us for Contractors Detailed Report and Catalog

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus, Ohio



KILLEFER *Revolving* SCRAPERS

WHEREVER earth is moved—on the big jobs, small jobs . . . in mines, quarries, oil fields . . . for building roads, airports, cantonments—you'll find Killefer Scrapers at work. They have the strength, speed, and stamina to handle all

your earth-moving jobs and to match your tractor power. There are three models and seven sizes from which to choose, ranging in capacity from 15 to 64 cubic feet, in power requirements from 15 to 60 H.P.

SOLD BY "CATERPILLAR" DEALERS EVERYWHERE

Soil Waterproofing With Resin Powder

**Increasing Interest Shown
In the Treatment of Wide
Variety of Soils; Studies
Cover Several States**

AS a scientifically studied product, investigated by soils engineers and chemists, resin seems to have possibilities in the stabilization of road bases. In its Research Series No. 73, 1940, the Engineering Experiment Station of Purdue University, Lafayette, Indiana, reports on "Frost Action in Highway Bases and Subgrades", based on a series of extensive tests in which all the standard stabilizing agents used today were studied, including Vinsol resin. Further research on the use of resin by other authorities shows that this admixture acts as a waterproofing agent throughout the soil. With an A-4 soil, a plastic sandy clay, about 1.0 per cent by weight of powdered resin is required for stabilization, but with the same soil and the resin used as a slurry, prepared with a small amount of caustic, less resin is needed for equal results.

Recent Use on City Street

In the spring of 1941 M. N. Yancey, City Manager of Tallahassee, Fla., and Miller Walston, City Engineer, decided to test the new Vinsol resin in the stabilization of the base of a 3,900-foot length of 20-foot roadbed leading to the Municipal Golf Course. This road carries an average of 500 cars a day and double that number on Sundays. The soil is a fuller's earth-like clay, called "fall-to-pieces" clay locally, with sand-clay in all combinations and some top soil. No special preparation of the soil was attempted through the addition of any other soils or replacing any section of the material. The soil was pulverized in place with plows, disks and road machines to a depth of 6 inches.

The resin for treatment was prepared by emptying the resin direct from the shipping bags into the 500-gallon metal tank of a water wagon until a total of 750 pounds of Vinsol resin was in the tank. Then 12.5 pounds of sodium hydroxide was added and the materials mixed by turning in a high-pressure

stream of water from a hose and filling the tank. One tank-load of the mixture was used to apply the resin to 960 feet of road, using a 7-foot spray bar, requiring three trips to cover the entire width. The soil was then remixed with the resin, using the same pulverizing and mixing tools as used for the original preparation of the base. Upon completion of the mixing and compaction by the tractor and grader, the road was hardplaned by a power road patrol, leaving the road section stabilized to a depth of 6 inches and with a crown of 1½ inches in the 20 feet. The shoulders were the same material as originally with fair ditches for surface drainage. Because of rain no further compaction by rolling was attempted.

For a period of three weeks the district around Tallahassee was subjected to soaking and washing rains, totaling 3.62 inches, according to the official rainfall records. Upon the cessation of the rains the resin-treated base dried off fully in three days. About 1/32 inch of the top was not fully bonded and was somewhat granular. This surface was primed with asphalt cut-back at 0.2 gallon per square yard which penetrated approximately ⅓ inch. This is much less than for the standard sand-clay bases used by the city. In them the penetration of prime is from ¼ to ⅓ inch.

The surface treatment then applied consisted of ¾-inch maximum-size slag and cut-back asphalt premixed and applied 1¼ inches thick.

Other Stabilization Projects

Similar test roads have been laid in other sections. One southeast of Blakely, Ga., on U.S. 27 and Georgia 1, followed the methods developed by the Portland Cement Association for cement stabilization of soils as to the spotting of the bags of powdered resin, spreading the material uniformly over the surface and mixing with the old lime-rock base. Four hours of dry mixing was followed by the addition of approximately 16 per cent of water and wet mixing was continued, followed by compaction with a sheepfoot roller, blading and final compaction with a traffic roller. This

base set up well and was part of a 7-mile experimental project of the Georgia State Highway Department in which other sections were stabilized with portland cement, coal tar and asphalt emulsion.

Other large-scale tests and projects include the streets at the Maritime Commission housing project at Pascagoula, Miss., streets and parking areas at a naval air base, and a 5,200-foot section laid under the direction of E. B. Cavallo, Construction Engineer, Mississippi State Highway Department, on Miss. Route 20 between Laurel and McGee, Miss.

Subgrade Conditions Important

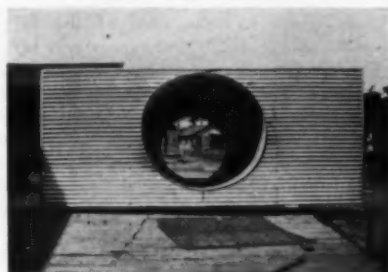
An attempt was made to treat the soil in the streets at the Lake Charles, La., Airport with Vinsol. This is high silty soil of the A-4 group and required 7 pounds of Vinsol per square yard. This soil handled very nicely in the laboratory but when the field work started, in November and December of 1941, it was found that this soil was very difficult

to dry; besides this difficulty, it was practically impossible to dry the sub-base sufficiently for compaction.

The site of this airport was a rice field where the local water table is very close to the ground surface. Any heavy equipment passing over the ground caused the surrounding soil to quiver like jelly. Faced with this condition, it was decided to withdraw Vinsol from this project because the underlying sub-soil could not be dried and compacted sufficiently to support the treated base.

The streets are now being stabilized with clay gravel. No wearing surface is being put on as yet and as failures develop, additional clay gravel will be hauled in. This point is being added here to emphasize the importance of checking such conditions when the soil survey is made if Vinsol, or any other stabilizing material, is to be used.

The USO War Fund Campaign is on. \$32,000,000 is needed to provide recreation for the men in the service. Do your share by giving—today!



CONFINING THE WORLD'S MOST DESTRUCTIVE FORCE

Water out of control is the most destructive force in nature. Engineers have done much to conquer this menace. The Nation's great networks of highways, landing fields, airports, camps and training grounds must be kept free from the hazard of floods. To accomplish this, wholly dependable, trouble-free drainage structures, able to withstand crushing punishment and abuse, are a primary requirement. Such drainage structures are best made of GOHI Pure Iron-Copper Alloy, the longest-lasting, low-cost ferrous culvert metal. Write fabricator nearest you for free copy of 72-page book on modern drainage practice.

New England Bolt Co. . . . Everett, Mass.
Central Culvert Co. . . . Ottumwa, Iowa
Capital City Culvert Co. . . . Madison, Wisc.
Bancroft & Martin Rolling Mills Co. . . . S. Portland, Me.
Denver Steel & Iron Works Co. . . . Denver, Colo.
The Lane Pipe Corporation . . . Bath, N. Y.
Dixie Culvert Mfg. Co. . . . Little Rock, Ark.
St. Paul Corrugating Co. . . . St. Paul, Minn.
The Newport Culvert Co. . . . Newport, Ky.



Meets copper-bearing pure iron requirements in all specifications published by nationally recognized specifying authorities.

GOHI PIPE CORRUGATED

GOHI CULVERT MANUFACTURERS, INC.,
NEWPORT, KY.



EVEN SIDEWALK SUPERINTENDENTS KNOW A GOOD BUCKET WHEN THEY SEE IT

Of course they judge on how quickly it buries itself for a big pay load, how it swings without spilling, to dump smoothly and cleanly into the waiting truck. They don't know, as the contractor's superintendent does know, how long Williams Buckets last with little maintenance expense, and how well they deliver on the toughest hardpan jobs or handle rubble or concrete chunks.

THE WELLMAN ENGINEERING CO.

7012 Central Ave., Cleveland, Ohio

If you want the engineering reasons why it will pay you to make your next bucket a Williams, send for descriptive bulletin.

Distribution in all parts of the country.

WELDED
ROLLED STEEL CONSTRUCTION
for GREATER STRENGTH and SPEED

WILLIAMS Buckets
built by WELLMAN



CORBY SUPPLY COMPANY

3942-46 W. Pine Blvd., St. Louis, Mo.

Representing

AMERICAN—Flexible Metal Hose
BUNL CO.—Portable Air Compressors
CHAMPION RIVET CO.—Rivets and Welding Rod
DETROIT HOIST & MACH. CO.—Air and Electric Hoists
DEVILBISS CO.—Paint Spray Equipment
HARDROCK WONDER DRILL CO.—Rock Drills and Tamping Breakers
W. H. KELLER, INC.—Super Pneumatic Tools
MUNSELL—Air-Operated Concrete Vibrators
PANGBORN CORP.—Sandblast Equipment
PENNSYLVANIA—Air Compressors and Pumps
DAVID ROUNDTOWN—Chain Hoists
STAYNEW—Air and Pipeline Fillets
H. A. STRAND & CO.—Flexible shaft Equipment
VAN DORN—Electric Drills, Grinders and Buffers
VICTOR—Welding and Cutting Apparatus
WESTINGHOUSE—Arc Welding Equipment
GUSTAV WIEDEKE CO.—Tube Expanders

JOSEPH KESL RENTAL EQUIPMENT CO.

430 Withers Ave., St. Louis, Mo.

(We rent construction equipment of all kinds)

Air Compressors	Motor Graders
Blade Graders	Pumps
Bulldozers, Backhoes	Rock Crushers
Concrete Mixers	Rollers
Crawler Wagons, Trailers	Rotary Scrapers
Elevating Graders	Sand, Gravel Etc.
Hoists	Shovels and Draglines
Hydraulic Scrapers	Wheel Tractors

Member: Associated Equipment Distributors

C. F. RABBEIT, INC.1523 N. Broadway
St. Louis, Mo.**Representing**

Baily Vibrator Co.	Huber Mfg. Co.
Cleveland Formgrader Co.	Insley Mfg. Co.
Cleaver-Brooks Co.	Kochling Co.
Concrete Surfacing Mach.	Kwik-Mix Concrete Mixer
Co.	Parsons Co.
Drive-Doyle Co.	Lidgerwood Mfg. Co.
Fairbanks, Morse & Co.	Northern Conveyor Co.
Good Roads Machinery Corp.	Parsons Co.
Helzel Steel Farm & Iron	Ross Mfg. Co.
Co.	Sterling Machinery Corp.
Frank G. Hough Co.	Sterling Wheelbarrow Co.

Member: Associated Equipment Distributors

THE GEO. F. SMITH CO., INC.

Franklin & Channing Aves., St. Louis, Mo.

Complete Plants Rented

American Fork & Hoe—Shovels, Hand	Link-Belt—Speed-o-Matic
Archers—Power Equipment	Shovels, Cranes, Draglines
Bemis—Tarpaulins, Bursip	Saw, Drills
Blackhawk—Jacks	Navo—Pumps
Bystron—Motor Mixers	Owen—Clamshell Buckets
Cleveland Formgrader—Bd.	Page—Buckets
Ed.	Red Star—Wheelbarrows
Cleveland Rock Drill—Air	Sagen—Derricks, Winches
Tools	Schee—Salamanders
Clyde—Hoists, Derricks	Silent Hoist—Power Winches
Comp. Surfacing Mach.—Elec.	Shelton—Shovels, Hand
Rubbing Stones	Smith, T. L.—Mixers, Trucks
Continental—Hoist	Symonds—Column Clamps
Bevel—Compressors	Templeton, Kenly—Trench
Edwards—Bar Shears	Braces, Jacks
Evered—Branding	Universal—Form Clamps
Fairbanks, Morse—Scales	Volcan—Hammers
Haus—Hoists, Scales	Whitman—Comp. Surfaces
Hinman—Bar Benders	Wiley—Power Floats
Kelly—Power Floats	Leach—Bore

Member: Associated Equipment Distributors

DALE & RANKIN, INC.

113 Frelinghuysen Ave., Newark, N. J.

Representing

AEROIL Heaters and Tools
ALWITE Guns and Fittings
CHAMPION Sewer Cleaning Machines
HEITZEL Road Forms and Bins
INGERSOLL-RAND Compressors and Tools
JACKSON Wheelbarrows
REX Mixers and Pavers
REX Pumps
RICHMOND SCREW ANCHOR (Concrete Accessories)
VIBER Elec. & Pow. Concrete Vibrators
WALKER-TURNER Radial Saws
WALSH Snow Plows
WINSLOW Scales

Member: Associated Equipment Distributors

JOHNSON & DEALAMAN, INC.

255 South Street Newark, N. J.

Representing

Allis-Chalmers Tractors, Graders, Power Units
American Snow Plows, Hoists, Sheaves
American Cable Trolley & Crescent Wire Rope
Baily Vibrators
Baker Bulldozers, Graders, Scrapers, Rd. Equip.
C. H. & E. Saw Tables & Hoists
Cleveland Pneumatic Tools
Garwood—Continental Scrapers, Bulldozers, Rd. Equip.
Hauk Concrete & Water Heaters, Oil Burning Equip.
Hetchkiss Road, Sidewalk & Concrete Forms
Hough Hydraulic Loaders, Sweepers & Allied Tractor Attachments
Jackson Wheelbarrows, Comp. Carts, Salamanders, etc.
Johnson Steel Bins, Batches, Scales
La Crosse Trailers
Marlow Centrifugal, Diaphragm & Plunger Pumps
Nelson Bucket & Snow Loaders
P & W Shovels, Cranes
Ransome Pavers, Mixers, Truck Mixers, Comp. Carts, Cutting Equipment
Red Star Wheelbarrows, Batch Boxes, Comp. Carts, Column Clamps & Adjustable Shores
Sullivan Air Compressors & Tools
Shovels, Cranes, Trailers, Rollers, etc.

Member: Associated Equipment Distributors

LLOYD G. ROSS

3090 Main St. Buffalo, N. Y.

Representing

Allis-Chalmers Mfg. Co.
Burch Spreaders
Coleman Trucks
General Excavator Co.
Hercules Roller Co.
Quick-Way Truck Shovels
Ross Snow Plows
Smith Mixers

Sale and Rent of All Kinds of Construction Equipment

COMPLETE Machinery & Equipment Co., Inc.

"Specialists in Pumps"

36-40 Eleventh St. New York

Long Island City

Representing

COMPLETE—Wellpoint Systems
INGERSOLL-RAND CO.—Air Compressors
KADCO CORP.—Dust Control Equipment
McKIERNAN-TERRY CORP.—File Hammers
MALL TOOL CO.—Concrete Vibrators, Chain Saws
MARLOW—Self-priming Centrifugal & Plunger Pumps
RENTAL SERVICE

Member: Associated Equipment Distributors

GEORGE MALVESE & CO.

New Hyde Park, N. Y.

Long Island Distributors:

ADAMS Graders	LOCKE Power Mowers
BRODERICK & BASCOM	OLIVER Implements
CLETRAC Crawler Tractors	SARGENT Snow Plows
EUCLED Scrapers	"SILVER KING" Tractors
LITTLEFORD Tractor Kettles	
Heaters, Distributors, etc.	
WORTHINGTON Power Mowers	
Also Pumps, Mixers	

Member: Associated Equipment Distributors

R. E. BROOKS COMPANY

"Serving the Contractor for over 28 years"

50 Church Street New York, N. Y.

Representing

Blaw-Knox Co.—Road and Sidewalk Forms, Bins, Batches, Finishing Machines, Buckets
Cleaver-Brooks Co.—Tank Car Heaters, Hoppers
Cleveland Tractor Co.—Cletrac Tractors
German-Rupp Co.—Pumps
Insley Mfg. Co.—Excavators, Concrete Chuting Plants, Buckets, Cars
Kochling Co.—Pavers, Mixers, Shovels, Cranes, Mud Jacks, Wheelers, Dumpsters, Longitudinal Finishers
Kwik-Mix Mfg. Co.—Coner. Mixers
Parsons Co.—Trench Machines

Member: Associated Equipment Distributors

A. P. DIENST COMPANY

Contractors' Supplies

140th St. & 3rd Ave., New York, N. Y.

Distributors for

DIENST Blasting Mats
DUFF Power Trench Brooms
GREGG Grease
KEYSTONE Grease
LINCOLN Grease Guns
TOLDO Bull Frog Wheelbarrows
WYOMING Red Edge Shovels
YALE Hoists

Telephone MOtt Haven 9-5450

HODGE & HAMMOND, INC.

Construction Equipment

1162 Grinnell Place New York, N. Y.

Phone: DAYton 8-5300

Exclusive Distributors

ALLIS-CHALMERS Tractors and Graders
BAKER Bulldozers, Graders, Snow Plows
BUCKEYE Ditchers, Spreaders, Flange Graders, Bulldozers
BUDA HUBBARD Earth Drills
EASTMAN Hl-Pressure Hydraulic Hose
GARDNER-DENVER Compressors and Rock Drills
HAUSS Clamshell Buckets
HOUGH Hydraulic Shovel Loaders
JAHN Heavy-Duty Trailers
MURPHY-DIESEL Engines, Power Units
NORTHWEST Shovels, Cranes, Draglines
PAGE Dragline Buckets
TINKEN Rock Bits
GAR WOOD Scrapers, Rip Rippers, Bulldozers

Member: Associated Equipment Distributors

J. C. HOUSTON

50 Church Street New York, N. Y.

Representing

BROWNING CRANE & SHOVEL CO.
HOISTING MACHINERY CO.

Warehouse

ELIZABETH, N. J.—L.V.R.R.

Member: Associated Equipment Distributors

HUBBARD & FLOYD, INC.

Construction Equipment

167th St. & Sedgwick Aves., New York, N. Y.

Telephone: JERome 7-8900

AUSTIN-WESTERN Sweepers, Graders, Rollers
EUCLED Trucks, Crawler Wagons, Tamping Rollers
KNICKERBOCKER Concrete and Mortar Mixers
LIMA Shovels, Cranes, Draglines, 1 yd. to 2 1/2 yd. capacity
ROGERS Heavy-Duty Trailers
THEW Shovels, Cranes, Backhoes, 1/4-1/2 yd. capacity
UNIVERSAL-LORAIN Metal-Cranes, Truckcranes
WICKWIRE-SPENCER Wire Rope
WILLIAMS Clamshell and Dragline Buckets
WORTHINGTON Portable Compressors, Air Tools

MAHONEY-CLARKE, INC.

Complete Line of Contractors' Equipment and Supplies

217 Pearl Street New York, N. Y.

Representing

Beach and C. H. & E. Saw Tables
Blackhawk Hydr. Jacks and Equip.
Boston Woven Hose & Rubber Co. All types of Hose and Belting
Broderick & Bascom Wire Rope
Hinman Bar Benders and Edwards Bar Cutters
Hetchkiss Road & Sidewalk Forms
Ingersoll-Rand Compressors, Drills, Pneum. Tools, etc.
Kardong Bar Benders
Lansing Concrete, Mortar Mixers, Wheelbarrows & Carts
Master Gas & Elec. Conc. Vibrators
Master Gasoline Engine-Driven Generators
Richmond Tyscurs, Anchors
Sterling Pumps of all descriptions
Tutill Hwy. Guard Rail, Hwy. Divider
Wiley Concrete Buckets
Yale Hoists & Pul-Lifts

Member: Associated Equipment Distributors

H. O. PENN MACHY, CO., INC.

140th St. & East River The Bronx, N. Y. C.

Branches

Mineola, L. I. Poughkeepsie, N. Y.

Representing

ATHEY TRUSS WHEEL
BARCO Hammers
BEACH Saw Rigs
BUCKEYE—File Shovels, Cranes, Draglines
CARDWELL Tractor Cranes
CATERPILLAR Tractors, Engines, Road Machines
DEERE Indus. Tractors
FOOTE Pavers
FRINK-Saw-Plows
HEITZEL Steel Bins, Forms
WILLAMETTE HYSTER CO.

Member: Associated Equipment Distributors

UNITED HOISTING CO., INC.

165 Locust Avenue

NEW YORK, N. Y.

Representing

Concrete Equipment Manufacturers—Concrete Vibrators
Construction Machy. Co.—Concrete, Plaster & Mortar Mixers, Saw Rigs, Pumps, Hoists and Pneumatic Tired Concrete Carts
Independent Pneumatic Tool Co.—"Thor" Pneumatic Tools, Hand Saws, and Sump Pumps
Sterling Mfg. Co.—Wheelbarrows & Concrete Carts
Sullivan Machy. Co.—Compressors, Pneumatic Tools and Accessories

Member: Associated Equipment Distributors

THE SYRACUSE SUPPLY CO.

294 Ainsley Dr. Syracuse, N. Y.

CONSTRUCTION EQUIPMENT DIVISION

Syracuse—Rochester—Buffalo

Representing

Athy Truss Wheel Co.
Bethlehem Wire Rope
Caterpillar Tractor Co.
D. A. Lebrant Co., Inc.
Gardner-Denver Co.
Goodyear Tire & Rubber Co.
Gravelly Motor Plow & Cultivator Co.
Hauk Heaters
Highway Equipment Co.
Iowa Mfg. Co.
Jaeger Machine Co.
Killer Mfg. Co.
LaCrosse Trailer & Equipment Co.
Lapland-Chaste Mfg. Co.
R. G. LeTourneau, Inc.
Link-Belt Speeder Corp.
Master Vibrator Co.
N. P. Nelson Iron Wks., Inc.
Timken Roller Bearing Service & Sales Co.—Timken Bits & Rods
Truckson Co.
Universal Form Clamp Co.
Willamette Hyster Co.

Member: Associated Equipment Distributors

NORTH CAROLINA EQ. CO.

Raleigh Stateville

Representing

Aerol Burner Company
American Cable Company
Bares Mfg. Co.
Buckeye Traction Ditcher Company
Busyrus-Erie Tractor Ex.
Cleaver-Brooks Company
Electric Tamer & E. Co.
Elgin Corporation
Euclid Road Machy. Co.
Fairbanks, Morse & Co.
Fairfield Engrs. Co.
Four Wh. Dr. Auto Co.
Frank G. Hough Co.
Galion Allsteel Body Co.
Galion Iron Wks. & Mfg.
Murphy Diesel Co.
Good Roads Machy. Corp.
Heitzel Steel Farm & Iron Company
Highway Trailer Co.
Ingersoll-Rand Company
Interant'l Harvester Co.
Iowa Manufacturing Co.
Jaeger Machine Company
Jeffrey Manufacturing Co.
J. F. Kiesler Company
Kensington Steel Company
Northwest Engineering Co.
Peters Bros. Corp.
Ransome Mfg. Co.
The C. S. Johnson Co.
Wellman Engineering Co.

Member: Associated Equipment Distributors

CAROLINA TRACTOR & EQUIPMENT COMPANY

S. Main Ext. Salisbury, N. Car.

Branch Office and Warehouse: Raleigh, N. C.

Representing

ATHEY Track-wheel Wagons
BARBER-GREENE Loaders, Grapple Plants, Finishers
BLAW-KNOX Steel Forms, Bins, Buckets, Truckmixers
CATERPILLAR Tractors, Graders, Power Units
C.M.C. Mixers, Pumps, Hoists
ETNYRE Illuminious Distributors, Flushers.
HUBER Rollers
JAHN Machinery Trailers
LAPLAND-CHOATE Wagons, Bulldozers
LETOURNEAU Carry-all Scrapers
SLUSSER-McLEAN Wheelers, Rippers, Presses
THREW Shovels, Cranes
TRUCKSON "Tractorway"
UNIVERSAL Crushing Equipment

Member: Associated Equipment Distributors

THE CLETRAC OHIO SALES CO.

E. 193rd Street and Euclid Ave. Cleveland Ohio

Representing

THE BAKER MFG. CO.—Power Scrapers
BUCKEYE TRACTION DITCHER CO.—Trailbuilders, Bulldozers
CENTAUR CO.—Highway Mowers
THE CLEVELAND TRACTOR CO.—Crawler Tractors, Front End Loaders
THE HEIL CO.—Power Scrapers, Bulldozers & Trailbuilders
THE ISAACSON IRON WORKS—Power Scrapers, Trailbuilders
MAIN STEEL, INC.—Snow Plows, Overhead Shovels
MEAD MORRISON—Winches
ROC COMPANY—Winches

W. T. WALSH EQUIPMENT CO.

3083 West 106th St., Cleveland, Ohio Tel. ORchard 4400

Allis-Chalmers—Tractors
Anshay—Dump Bodies
Atlas—Conveyors
Baker Mfg. Co.—Bulldozers
Buckeye—Ditchers
Busyrus-Erie—Shovels, Cranes, Draglines
Cads—Gas & Diesel Power Units, Generator Sets
Calkins—Corrugated Sheet Piling
Cleveland—Formgraders
Cleveland Rock Drill Co.—Air Tools
Complete—Wellpoint Systems
Crawford—Formgraders
Euclid Road Machy. Co.—Meters
Hough—Tractor Front End Loaders
Jackson—Vibrators
LaCrosse—Trailers
Member: Associated Equipment Distributors

SOUTHERN OHIO EQUIP. CO.

445 Woodlawn Ave., Zanesville, Ohio

Phone 1287

Distributors for

Allis-Chalmers Mfg. Co.	F. G. Hough Co.
Austin Powder Co.	Iowa Mfg. Co.
Baker Mfg. Co.	Paris Mfg. Co., Inc.
Bethlehem Steel Co.	Schramm, Inc.
Byers Machine Co.	Shunk Mfg. Co.
Cleveland Rock Drill Co.	Slusser-McLean Co.
D-A Lubricant Co.	Timken Roller Bearing Co.
General Conveyor Co.	Gar Wood Industries, Inc.

Member: Associated Equipment Distributors

CLYDE EQUIPMENT CO.

Portland, Ore. Seattle, Wash.

Representing

Advance Car Mover Co.
Air-Way Pump & Equip. Co.
Alexander Imperial Diesel Eng. Co.
Barnes Mfg. Co.
Beets Bros.
Bucyrus-Erie Co.
Buda Company
Clyde Iron Works, Inc.
Coffing Hoist Co.
Concrete Surf. Machy. Co.
Danco Corp.
Davenport Steeler Corp.
Dixon Valve & Coupling Co.
Duff Horton Mfg. Co.
Geo. Hais Mfg. Co., Inc.
Handlan Inc.
C. S. Johnson Co.
Klausner Mfg. Co.
Kohler Co.
LaCrosse Company
A. Leach & Sons Rope Co.
The Linde Air Products Co.
Marvel Equipment Co.
W. P. McCaffrey, Inc.
Alexander Wilburn Co.
Oshkosh Motor Tr. Mfg. Co.
Ortry Crane & Shovel Co.
Owen Bucket Co.
Ransome Machy. Co.
Red Star Products Inc.
Sagen Derrick Co.
Sauerman Brothers, Inc.
Shankum Co.
T. L. Smith Co.
Smith Engineering Works
Smith Welding Equip. Co.
Sterling Wheelbarrow Co.
Sullivan Machinery Co.
Templeton Kenly & Co., Inc.
Valdeto Pressed Steel Co.
Union Fork & Hoe Co.
Van Dorn Iron Works Co.
Volcan Iron Works
Wiley Machine Co., Inc.
Worthington Mower Co.

Member: Associated Equipment Distributors

LOGGERS & CONTRACTORS MACHINERY COMPANY

240 S.E. Clay St. Portland, Ore.

Representing

Archer Iron Works	W. E. Grace Mfg. Co.
Broderick & Bascom Rope Co.	Harnischfeger Corp.
Buckeye Traction Ditcher Co.	Hercules Motors Corp.
Butler Bin Co.	Ingersoll-Rand Co.
Chain Belt Co.	J. E. Ingram Equip. Co.
Diamond Iron Works	Kay-Brunner Steel Products Inc.
Euclid Road Machy. Co.	Metal Forms Corp.
Garlinghouse Bros.	Plymouth Locomotive Works
	Ransome Machy. Co.—Hoists
	Wiley Machine Co., Inc.
	Worthington Mfg. Co.

Member: Associated Equipment Distributors

EDELEN & BOYER COMPANY

Offices and Warehouse 235 North 23rd St. Philadelphia Penna.

Distributors of

Adon Stone Spreaders	Jackson Wheelbarrows, etc.
Adon Black Top Pavers	LaCrosse Tu-Way Trailers
Aerol Heaters, Melting Pots	Lidgerwood Hoists
Archer Towers, Buckets	Marsh-Capren Mixers
Buckeye—Shovels, Tractors, Ditchers, Spreaders	Multi Foot Pavers
CMC Master Mixers, Saw Rigs	New Haven Burliapped-Cot-Im Blankets
CMC Self-Priming Pumps	Pulsometer Steam Pumps
Dampster—Dumpsters	R-B Fingergrader
Flex-Plane Finishing Machine	Sagen Derricks, etc.
Hayward Clamshell Buckets	Sullivan Portable Air Comp.
Heitzel Finishing Mach.	Tru-In Steel Cable
Heitzel Steel Forms, Bins	Union File Hammers
	White Vibrators
	Wunder Concrete Mixers

Member: Associated Equipment Distributors

GILES & RANSOME

17th St. & Sedgley Ave., Philadelphia

Representing

Athy Truss Wheel Co.—Crawler Wagons
Barnes Mfg. Co.—Centrifugal Diaphragm and Force Pumps
Blaw-Knox Co.—Clamshell Buckets, Road Forms, Material and Cement Bins
"Caterpillar"—Tractors and Road Machinery
R. G. LeTourneau, Inc.—Carralls, Buggies
Lapland-Chaste Mfg. Co.—Bulldozers, Trailbuilders, Carralls, etc.
Master—Elec. Gas Concrete Vibrators
Northwest Engineering Co.—Gasoline Cranes, Shovels and Draglines
Ord—Road Finishing Machine
Ransome Concrete Machinery Co.—Concrete Mixers and Appliances

Member: Associated Equipment Distributors

HOWARD W. READ CORP.

N. W. Cor. 25th and Wharton Sts., Philadelphia, Pa.

Distributors

Ralph B. Carter Co.	Quick-Way Truck Shovel Mfg. Co.
Insley Mfg. Co.	Volcan Iron Works, Inc.—File Hammers
Kochling Co.	

Also Carry in Stock: Hoisting Engines, Gas and Steam

SERVICE SUPPLY CORPORATION

20th and Venango Sts., Philadelphia, Pa.

Representing

Bay City Shovel, Inc.—Shovels, Cranes, etc.
Beebe Bros. Co.—Saw Rigs
Chicago Pneumatic Tool Co.—Compressors, Air Tools
W. F. Heald & Co.—Ship Molds
Hercules Company—Road Rollers
International Harvester Co.—Indus. Wheeltype and Crawler Tractors
Jaeger Machine Co.—Mixers, Truck Mixers, Pumps, Black Top Pavers, Finishing Machines
C. S. Johnson & Co.—Bins, Batches, Cement Handl. Eq.
Lambert-Natl'l Hoist Co.—Hoists
Littlefield Bros.—Road Oil Distrib. Heating Kettles, etc.
McKiernan-Terry Corp.—Pile Drivers
N. F. Nelson Iron Wks., Inc.—Loaders & Belt Conveyors
The Parsons Company—Trench Machines, Boom Pumps
Pioneer Engineering Wks., Inc.—Roll Crushers
Silent Hoist Winch & Crane Co.—Kranes, Kars, Winches, Capstans, Car Pullers, etc.

Member: Associated Equipment Distributors

WILSON-WEESNER-
WILKINSON CO.

Nashville

Tennessee

Representing

Allis-Chalmers Mfg. Co.
Ames Baldwin Wyoming Co.
Baker Mfg. Co.
Barber-Greene Co.
Blaw-Knox Co.
Cleaver-Brooks Co.
Clyde Iron Works, Inc.
E. D. Etnyre Co., Inc.
Garman-Rupp Co.
Ingersoll-Rand Co.
Insley Mfg. Co.
Koehring Co.
Littlefield Bros.
Master Vibrator Co.
The Parsons Co.
Smith Engineering Works
Gar Wood Indus., Inc.

NASHVILLE—KNOXVILLE

Warehouse Stocks of Service

Reinforcing Steel and Mesh

Member: Associated Equipment Distributors

CONSTRUCTION EQUIPMENT CO.

1118-1124 Ide Ave., Spokane, Wash.

Aeroli Burner Co., Inc.
Archer Iron Works
Beebe Bros.
Blythe Mfg. Co.
Broderick & Bascom Rope
Bucyrus-Erie Co.
Buffalo-Springfield Roller Co.
Butler Bin Co.
Chain Belt Co.
Climax Eng. Co.
Concrete Surf. Machy. Co.
D-A Lubricant Co.
H. E. Dietz Co.
Duff-Norton Mfg. Co.
Fairbanks, Morse & Co.
Fate-Roet-Heath Co.
Homestead Valve Mfg. Co.
Krohn-Hy. Supply Co.
Lafayette Co.
The Linda Air Products Co.
M. & N. Wire Clamp Co.
Mail Tool Co.
Niagara Mfg. Co.
Red Star Products Co.
Saugen Derrick Co.
Sheldon Mfg. Co.
Sterling Wheelbarrow Co.
Sullivan Machinery Co.
Templeton, Kenly & Co.
Williamette Hyster Co.
Williams' Buckets, etc.
Young Iron Works

Member: Associated Equipment Distributors

Index to
Advertising

Aeroli Burner Co., Inc.	24
Alloy Steel & Metals Co.	32
American Cable Div., American Chain & Cable Co., Inc.	9
American Steel Scraper Co.	21
Ariens Company	35
Austin-Western Road Machy. Co., The	5
Baker Mfg. Co.	40
Barrett Division, Allied Chemical & Dye Corp.	22
Beebe Bros.	16
Bethlehem Steel Co.	24
Blaw-Knox Co.	41
Briggs & Stratton Corp.	37
Buckeye Traction Ditcher Co.	23
Buffalo-Springfield Roller Co., The	44
Burch Corp.	40
Carey Co., Philip, The	25
Caterpillar Tractor Co.	15
C. H. & E. Mfg. Co.	37
Chicago Pneumatic Tool Co.	25
Cleveland Rock Drill Co., The	13
Complete Machy. & Equip. Co., Inc.	21
Construction Machy. Co.	42
Continental Rubber Works	43
Cummer & Son Co., The F. D.	28
Curing Materials Co.	31
Dempster Brothers, Inc.	33
Embury Mfg. Co.	8
Flexible Road Joint Machine Co.	30
Fulton Bag & Cotton Mills	32
Galion Iron Works & Mfg. Co.	45
Garlinghouse Bros.	42
Gatke Corp.	37
Geerpres Winger, Inc.	35
General Excavator Co.	38
Gohi Culvert Mfrs., Inc.	48
Griffin Wellpoint Corp.	31
Haiss Mfg. Co., Geo.	45
Hardocg Drill Co.	28
Hayward Co., The	46
Heil Co., The	30
Highway Steel Products Co.	38
Hobart Bros. Co.	16
Industrial Brownhoist Corp.	42
Jaeger Machine Co., The	12, 47
Johnson Co., C. S.	34
Kelley Co., Inc., E. B.	30
Killefer Mfg. Corp.	47
King Machine & Mfg. Co.	36
Koehring Co.	20
Kron Co.	32
Laclede Steel Co.	44
Lansing Company	6
Le Roi Co.	45
LeTourneau, Inc., R. G.	43
Littlefield Bros.	19
Madsen Iron Works	22
Mail Tool Co.	46
Marlow Pumps	14
Marvel Equipment Mfrs., Inc.	18
McKiernan-Terry Corp.	29
Michigan Power Shovel Co.	33
National Carbide Corp.	8
Owen Bucket Co., The	7
Parsons Co.	34
Pettibone Mulliken Corp.	29
Robins Conveying Belt Co.	29
Roebbling's Sons Co., John A.	11
Roeth Vibrator Co.	34
Rogers Bros. Corp.	43
Safety-ize Mfg. Co.	20
Sand's Level & Tool Co.	19
Saugen Derrick Co.	9
Schramm, Inc.	19
Sinclair Refining Co. (Inc.)	10
Smith Co., T. L.	21
Smith Engineering Works	39
Standard Oil Co. of Calif.	28
Standard Oil Co. (Ind.)	18, 35
Standard Steel Corp.	36
Standard Steel Works	12
Sterling Machy. Corp.	10
Sterling Wheelbarrow Co.	25
Stewart-Warner Corp.	31
Stoody Co.	44
Sullivan Machy. Co.	17
Templeton, Kenly & Co.	39
Texas Co., The (asphalt)	3
Texas Co., The (lubricants)	6
The Shovel Co., Universal Crane Div.	8
Thompson Materials Corp.	24
Union Fork & Hoe Co.	38
Union Iron Works, Inc.	20
Universal Power Corp.	39
Viber Co.	13
Walter Motor Truck Co.	16
Waukesha Motor Co.	46
Wellman Engineering Co., The	48
White Mfg. Co.	11
Whiteman Mfg. Co.	14

J. JACOB SHANNON & CO.

1744—Sedgley Avenue—1744

PHILADELPHIA

Representing

Burch Corp.—Snow Plows, Mainframes
C. H. & E. Mfg. Co.—Saw Rigs, Rollers, Hoists
Clyde Iron Wks., Inc.—Bins, Batches, Cement Handl. Eq.
Concrete Surfacing Machinery Co.—Berg Surfaces
Electric Trencher & Equipment Co.—"Jackson" Vibrators
Eustice Machy. Co.—Plaster Mixers
Gardner-Deaver Co.—Air Compressors
Gibson Brothers Co.—Conc. Mixers
Haber Mfg. Co.—Road Rollers
Jay Mfg. Co.—Snow Loaders
Link-Belt Speed-o-Matic Shovels, Cranes, Draglines
Richmond Serow Answer Co.—Pump ties
W. A. Riddell Corp.—Road Graders
John A. Roebbling's Sons Co.—Wire Rope, Fittings
Saugen Derrick Co.—Derricks and Winches
Shannon-Derricks and Derrick Fittings
Sterling Machy. Corp.—Pumps, Hoists, Generators
Van Dorn Iron Works Co.—Sweepers

Member: Associated Equipment Distributors

BROWNING-FERRIS MACHY. CO.

205 Exposition Ave. Dallas, Texas

Texas at Rice Sts. Houston, Texas

Representing

Cleveland Trencher Co.
Festa Company—Pavers
Galion Iron Works & Mfg. Co.
Bucyrus-Erie—Scrapers, Bulldozers
Ingersoll-Rand Company
International—Tractors
Iowa Mfg. Co.—Cedar Rapids Line
Jaeger Machine Company
Jones Superior Mach. Co.
Littlefield Bros.
The Owen Bucket Company
Page Engineering Co.
Sterling Wheelbarrow Co.
The Shovel Company
Traskon Company

Member: Associated Equipment Distributors

BOEHCK EQUIPMENT CO.

2404 W. Clybourn St. Milwaukee, Wis.

Representing

American Hoist & Derrick
Jaeger Machine Co.
Caine Steel Co.
Centaur Co.
Concrete Surfacing Machy. Co.
Electric Trencher & Equip. Co.
Hank Mfg. Company
Hercules St. Products Co.
Iowa Manufacturing Co.
Independent Pneumatic Tool Co.
Jaeger Machine Co.
C. S. Johnson Company
Jones Superior Machine Co.
A. Lushen & Sons Rope Co.
Lima Locomotive Works
McKiernan-Terry Corp.
N. F. Nelson Iron Wks., Inc.
Portable Machinery Company
Red Star Products, Inc.
Rogers Bros. Corp.
Saugen Derrick Co.
Superior Concrete Assest-
ing, Inc.
Union Fork & Hoe Co.
Walker-Turner Co., Inc.
Wellman Engineering Co.

Member: Associated Equipment Distributors

CUNNINGHAM-ORTMAYER CO.

429 W. Michigan St. Milwaukee, Wis.

Butler Bins, Batches
Case Tractors and Mowers
Cleveland Formgrader Pav-
ing Equipment
Coffing Hoists
Calcium Chloride "Dow-
dack"
"Dance" Salamanders
Flexible Road Joint Ma-
chines
Galion Graders, Rollers and
Bridges
Good Roads Snow Plows
Gorman-Rupp Pumps
Gravelier Crushers and
Pulverizers
Handlan 100-Hour Lantern,
Torrises
Hertz Steel Road Forms
Ingersoll-Rand Air Com-
pressors, Tools
Member: Associated Equipment Distributors

NIXON-HASSELLE COMPANY, INC.

Contractors' Equipment

Chattanooga Tennessee

Representing

Archer Towers, Spouting
Equipment
Austin-Western Graders,
Crushers, Rollers, Scrap-
ers, etc.
Blaw-Knox Batches, Buck-
ets, Forms, etc.
Bros Tank Car Heaters, etc.
Bucyrus-Erie Bulldozers,
Scrapers, etc.
Four Wheel Drive Trucks
Hoist Loaders, Conveyors,
etc.
Hough Road Sweepers,
Sprinklers, etc.
Murphy Diesel Engines
Member: Associated Equipment Distributors

R. B. EVERETT & CO.

3112-18 Harrisburg Blvd. Houston, Texas

Representing

BLAW-KNOX Road Plant
Equipment, Bins, Clam-
shell Buckets
AMERICAN Hoisting Ma-
chinery
"P. & H." Gasoline Cranes
McKiernan-TERRY Pile
Hammers, etc.
CONCRETE Asphalt Equip.
CHAIN BELT Concrete
Mixers, Saw Rigs, Pavers
NOVO Engines, Hoists,
Pumps
Saugen Derricks, etc.
Timken Detachable Bits
Vulcan Gas Locomotives
Member: Associated Equipment Distributors

BROOKS EQUIP. & MFG. CO.

Knoxville 408 Davenport Rd. Tennessee

Representing

J. B. Adams Co.
Buckeye Traction Ditcher Co.
Bucyrus-Erie Co.
Buda Co.
Cleveland Rock Drill Co.
Columbus Conveyor Co.
Construction Machy. Corp.
Davy Compressor Co.
Electric Trencher & Equip. Co.
Euclid Road Machy. Co.
Geo. Hales Mfg. Co.
Hetzl Steel Form & Iron Co.
Hercules Co.
Hose Accessories Co.
Frank G. Hough Co.
Hughes-Kennan Co.
International Harvester Co.
Mann Mfg. Corp.
Manhattan Rubber Mfg. Div.
Municipal Supply Co.
N. F. Nelson Iron Wks.
Pioneer Engrs. Wks., Inc.
Russo Mfg. Co.
Saugen Derrick Co.
Silent Hoist Winch & Crane Co.
Tulsa Winch Co.
Union Wire Rope Co.

Member: Associated Equipment Distributors

PHILLIPS MACHINERY CO.

900 East Cary St. Richmond, Va.

Representing

Aeroli Burner Co., Inc.
Austin Machinery Corp.
Broderick & Bascom Rope
Co.
Butler Bin Co.
Chain Belt Co.
Cleveland Trencher Co.
Clyde Iron Wks., Inc.
Concrete Surf. Machy. Co.
Independent Pneu. Tool Co.
Jackson Mfg. Co.
Jones Superior Mach. Co.
Manitowoc Engineering Wks.
Master Vibrator Co.
Owen Bucket Co.
Page Engineering Co.
Rogers Brothers Corp.
Saugen Derrick Co.
Sawerman Brothers, Inc.
Skilaw, Inc.
Vulcan Iron Works
Walker-Turner Co.

Member: Associated Equipment Distributors

DROTT TRACTOR CO., INC.

Milwaukee Wisconsin

Representing

Allis-Chalmers Tractors,
Graders, Speed Patrols,
Hoisting and Power Units
Baker Bulldozers, Grabs,
Centuries, Snow Plows, etc.
Brett Equipment (Hi-Way
Service Corp.) Angledo-
zers, Bulldozers, Tractor
and Snow Plow Equip-
ment, etc.
Gar Wood Scrapers, Rippers,
etc.
General Motors Diesel Pack-
aged Power Units
Gunnison Flushers
Hough Gravel and Snow Load-
ing Equipment, Conveyors,
etc.
Huck Portable Melting Ket-
tles
Hercules Rollers
Highway Trailer Earth Bur-
rowing Machines
Hough Sweepers, Shovels
Hughes-Kennan Tractor
Cranes
Jacobson Mowers
La Grasse Trailers
Lansing Trucks
Pacific Car & Dry Hoists,
Cranes
Pioneer Conveyors, Gravel &
Rock Crushing Eq., etc.
Quincy Compressors
Rogers Mowers
Saugen Derrick Co.
Scrapers, etc.
Saugen Pavers
"Silent Hoist" Cranes
Sheldon Shovels, Cranes, Mo-
tocranes
Tulsa Snow Winches
Waukesha Snow Plows

Member: Associated Equipment Distributors

OSBORNE EQUIPMENT
COMPANY

525 State Street, Knoxville, Tennessee

Distributors for

American Cable Div., Amer-
ican Chain & Cable Co.
Ariens Co.
Boston Woven Hose & Rub-
ber Co.
Buckeye Traction Ditcher Co.
J. I. Case Co. (Industrial)
Cleveland Tractor Co.
Davenport Bester Corp.
Galion Iron Works & Mfg.
Co.
Member: Associated Equipment Distributors

STAR MACHINERY CO.

1741 First Ave., South Seattle, Wash.

Representing

Advance Machine Co.
Air Reduction Sales Co.
American Hoist & Derrick Co.
American-Marsh Pumps,
Inc.
Butler Bin Co.
Chain Belt Co.
Cleveland Trencher Co.
Clyde Iron Wks., Inc.
Concrete Surf. Machy. Co.
Independent Pneu. Tool Co.
Jackson Mfg. Co.
Hercules Motors Corp.
Independent Pneu. Tool Co.
Master Vibrator Co.
Oster Mfg. Co.
Red Star Mfg. Co.
Reed-Pratt Corp.
John A. Roebbling's Sons Co.
Whitman Engrs. Co.
Wellman Engrs. Co.
Wisconsin Motor Corp.
Witte Engine Corp.
Warrington Pump & Machy. Corp.

Member: Associated Equipment Distributors

HUNTER TRACTOR &
MACHY. CO.

327 So. 16th St. Milwaukee, Wis.

Exclusive Distributors

Aeroli Burner Co.
American Steel & Wire Co.
Bare Mfg. Co.
Bates Valve Bag Corp.
Beebe Bros.
Blaw-Knox Co.
Buckeye Tr. Ditcher Co.
Buffalo Spr'ld Roller Co.
Chain Belt Company
Clyde Iron Works, Inc.
Dempster Bros., Inc.
Kelley Electric Mach. Co.
Master Vibrator Co.
Northwest Engrs. Co.
R-B Equipment Co.
Saugen Derrick Co. (open
account)
Sawerman Bros., Inc.
Silent Hoist Winch & Cr.
Co.
Sullivan Machy. Co.
Syntron Co.
Universal Farm Clamp Co.
Vapor Blast Mfg. Co.
Vulcan Iron Works

Member: Associated Equipment Distributors

FLORIDA-GEORGIA
TRACTOR CO.

Jacksonville—Lakeland—Miami

Distributors for

American Cable Div., Amer-
ican Chain & Cable Co.
Brookville Locomotive Co.
Buckeye Traction Ditcher
Co.
Bucyrus-Erie Co.
Tractor Equipment
Buda Co.
Chain Belt Co.
Cleaver-Brooks Co.
Cleveland Formgrader Co.
Electric Trencher & Eq. Co.
Euclid Rd. Machy. Co.
Four Wheel Drive Auto Co.
Galion Allsteel Body Co.
Gardner-Deaver Co.
Hug Co.
Hetzl Steel Form & Iron Co.
Hough Co., Frank G.
Ingersoll-Rand Co.
Ingram Equipment Co., J. E.
Inf'l Harvester Co.
Iowa Mfg. Co.
Jones Superior Mach. Co.
Kensington Steel Co.
Murphy-Diesel Co.
Northwest Engrs. Co.
Owen Bucket Co.
Page Engrs. Co.
Rogers Bros. Corp.
Russo Mfg. Co.

Member: Associated Equipment Distributors

P. A. NEFF

1920 N. W. Miami Court, Miami, Fla.

Sales—Service—Rentals

Butler Bin Co.—Bins, Batches, Scales
J. I. Case—Industrial Contractors
Chain Belt Co.—Mixers, Pumps, Pavers
De Walt Products Corp.—Wood Working Machines
Independent Pneumatic Tool Co.—Air Tools, Electric
Drills, Hammers, Hand Saws
Lansing Co.—Wheelbarrows, Concrete Carts
Le Roi Co.—Air Compressors
Mail Tool Co.—Vibrators, Saws, Terrazzo Machines
Miscellaneous Contractors Supplies

Member: Associated Equipment Distributors

J. E. INGRAM EQUIP. CO.

1146 West Laurel St. San Antonio, Texas

Representing

Barber-Greene Co.
Buckeye Traction Ditcher
Co.
Buda Co.
Chain Belt Co.
DeSoto Foundry Co.
Dux Mfg. Co.
Etnyre & Co., E. D.
Ingram Rollers
Mail Tool Co.
Murphy-Diesel Co.
Northwest Engrs. Co.
Owen Bucket Co.
Simplicity Engrs. Co.
Sullivan Machy. Co.
Whiteman Mfg. Co.

Member: Associated Equipment Distributors

Distributors

not already represented in this Direc-
tory of Equipment Distributors, can se-
cure rates for these cards and further
particulars of our service by writing to

Contractors and Engineers

Monthly

470 Fourth Ave., New York.

R. G. MOELLER COMPANY

14415 Meyers Rd., Detroit, Mich.

Representing

Bay City Shovel, Inc.
Bethlehem Steel Co.
C. H. & E. Mfg. Co.
The United Corp.
Draw Corp.
Flexible Road Joint
Machinery Co.
Hetzl Steel Form &
Iron Co.
Hercules Motors Corp.
Homestead Valve Mfg. Co.
Ingersoll-Rand Co.
Jas. F. Kiebler Co.
Le Roi Co.
Lincoln-Schuster Floor
Machy. Co.
Link-Belt-Speeder Corp.
McKiernan-Terry Corp. and
Lambert-Natl'l Hoist Div.
Milwaukee Elec. Tool Co.
Saugen Derrick Co.
Slusser-McLean Scraper Co.
Smith Engrs. Works
Smith Co., T. L.
Sterling Wheelbarrow Co.
Templeton-Kenly Co.
Telado Wheelbarrow Co.
Tri-Lok Co.
Waukesha Motor Co.
White Mfg. Co.
Wisconsin Motor Corp.

Member: Associated Equipment Distributors

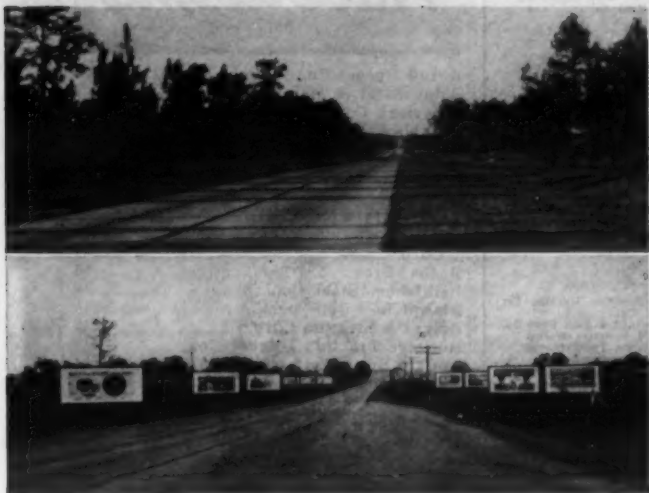
A. L. GUILLE

825 Wainwright Bldg., Norfolk, Va.

Representing

Barber-Greene Co.—Conveyors, Loaders, Ditchers, Black-
top Mixers, Finishers
Hetzl Steel Form & Iron Co.—Steel Rd. Forms, Curb &
Gutter Forms, Aggregate Bins, Bulk Cement Bins, etc.
Flexible Road Joint Machine Co.—Concrete Flexplane
Finishers, Joint Machines
Fate-Roet-Heath Co.—Plymouth line of Internal Combust-
ion and Diesel Electric Locomotives

Contractors *and* Engineers Monthly



C. & E. M. Photos

From the sublime to the pathetic. Top photo, a typical scene on U. S. 49 between Gulfport and Hattiesburg, Miss., showing well-landscaped roadsides free of signs. Bottom, U. S. 12 entering Hattiesburg as seen from its junction with U. S. 49, showing what happens when control ceases at the city line. See page 32.



C. & E. M. Photos

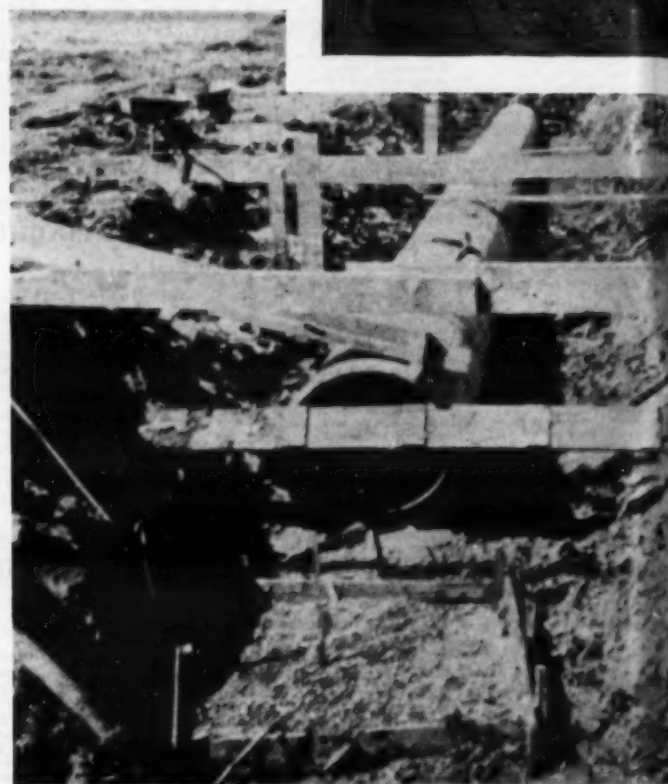
A part of the set-up that speeded batching on the Mallett Construction Co.'s pavement-widening contract on U. S. 52 through St. Cloud, Minn.

At right, a completely assembled expansion joint on the shoulder, ready to be placed, on the Mallett paving job. See page 14.



C. & E. M. Photo

Widening and deepening the channel of Stonycreek River at Johnstown, Penna. A Marion shovel is seen loading a Mack truck on the right side of the channel. S. J. Groves & Sons Co., contractor for the work, left a central dike for hauling which was removed as the last operation in widening. See page 1.



C. & E. M. Photo

A line of 42-inch concrete drainage pipe with gravel foundation for a brick manhole, shown in the foreground, at an airport in Louisiana. See page 2.



At left, old motor graders, trucks, wheels and other "junked" highway equipment gathered together at the Raleigh Shop of the North Carolina State Highway and Public Works Commission for shipment to steel mills for use in war production. At right, after years of yeoman service on North Carolina highways, an old motor grader chassis starts on its journey to lick the Japs. See page 10.